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THEME SETS™

Using Simple Machines

TEACHER'S GUIDE • SCIENCE

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NATIONAL GEOGRAPHIC
School Publishing

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Contents

Program Overview
- About the Program 4
- Program Components 6
- Developing Literacy Skills 10
- Flexible Use 11
- Pacing Guide 12
- Differentiated Instruction 14
- Research-Based Instruction 16
- Factors Affecting Readability 18
- Placing Students in Levels 20
- Supporting English Language Learners 22
- Assessing Progress 26
- Extend Your Reading 28

Theme Overview 30

Lesson 1 34

Lesson 2 39

Lesson 3 43

Lesson 4 47

Lesson 5 51

Extend the Learning 55

Activity and Assessment Masters 58

Activity Masters 59

Assessment Tests 73
- Open-Book Test 73
- Tests 74

Test Answers 82

About the Program

"Making A Difference Means Making It Different."

From Position Statement of the International Reading Association (March 2000)

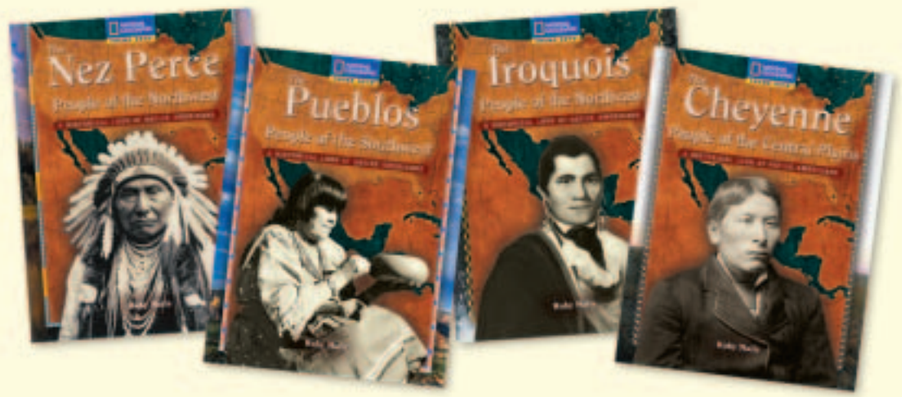
One size does not fit all

Today's students come from a variety of cultural and language backgrounds, socioeconomic levels, and academic levels. Educators realize one size does not fit all, so no one book can meet the needs of all students.

The **THEME SETS** program provides differentiated resources for teachers to meet the diverse needs of their students. Each ***Theme Set*** provides four books crafted to match the wide range of reading levels within each classroom. All books provide the same core concepts but within different contexts and at different reading levels. For students who struggle with content-area textbooks, the **THEME SETS** provide core curriculum that is broken down, not watered down. For students who are reading on grade level, the **THEME SETS** provide literacy and core content curriculum with appropriate challenge and support. For students who need more challenging material, the **THEME SETS** provide literacy and core content in ways that develop students' critical thinking skills.

Equity in education is every child's right

Equity in education is tied to students' access to quality curriculum, materials, and teaching. Yet students, especially those who struggle with reading, are often denied access to core content. It is essential that these students have access to grade-level curriculum to prevent the knowledge gap from widening as they proceed through the grades. The **THEME SETS** offer grade-level curriculum to students across a wide range of reading levels. The **THEME SETS** also support students as they develop reading and writing strategies and skills.



Program Goals

National Geographic School Publishing is committed to providing the highest quality materials that meet the diverse needs of teachers and students.

The THEME SETS offer materials that

- **facilitate differentiated instruction.**
- **promote educational equity through access for all students.**
- **provide essential standards-based curriculum in science and social studies.**
- **support the developmental needs of students at a variety of reading levels.**
- **provide explicit instruction in vocabulary and comprehension strategies.**
- **develop fluency.**
- **offer comprehensive teaching materials that streamline teacher planning.**

Program Consultants

Shirley Dickson, Ph.D. is an educational consultant in literacy for kindergarten through the secondary grades. She consults on reading research projects and works with states as they develop and implement state literacy policy. Dr. Dickson's current work includes research in preventing reading difficulties in kindergarten through grade 3. Her expertise is the design of effective and comprehensive reading instruction for typical and struggling learners. Dr. Dickson is a former Director of Literacy for the Education Commission of the States; Director of Statewide Curriculum Initiatives for Texas, including the Reading and Math Initiatives; Director of Reading for Texas; professor in literacy and special education at Northern Illinois University; and special educator.

Margit E. McGuire, Ph.D. is Director and Professor of Teacher Education at Seattle University and a former president of the National Council for the Social Studies. She is the recipient of the Washington Award for Excellence in Teacher Preparation and has presented nationally and internationally on topics related to social studies and teacher preparation. She is the author of the Storypath Program and is engaged in a number of research projects on the Storypath approach both in Seattle, Washington, and Sydney, Australia.

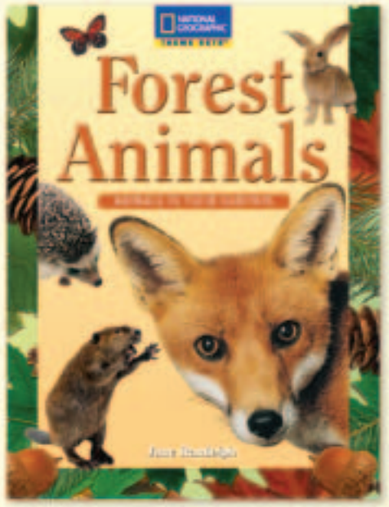
James A. Shymansky, Ph.D. is an E. Desmond Lee Professor of Science Education at the University of Missouri-St. Louis. He currently directs the "Science Cooperatives Project," a five-year NSF systemic reform effort involving 1,200 elementary school teachers from 36 school districts in rural Missouri and Iowa. He has authored an elementary science textbook series and a K–12 science review series. He has also authored more than a hundred research publications, book chapters, and monographs on teaching and learning elementary school science. He is the past editor of the *Journal of Research in Science Teaching* and currently senior editor of the *International Journal of Science and Mathematics Education* and President-Elect of the National Association for Research in Science Teaching.

Program Components

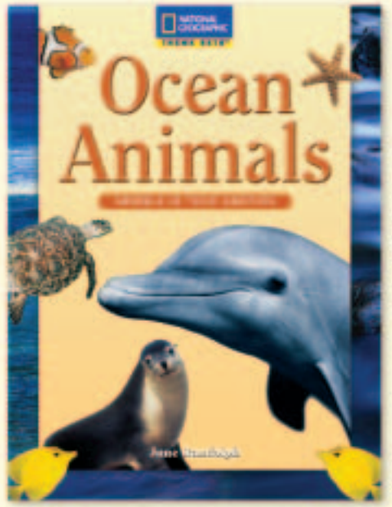
Student Books

Each ***Theme Set*** includes four books on different topics. Each book is written at a different reading level and focuses on a specific topic to explain and illustrate the central theme.

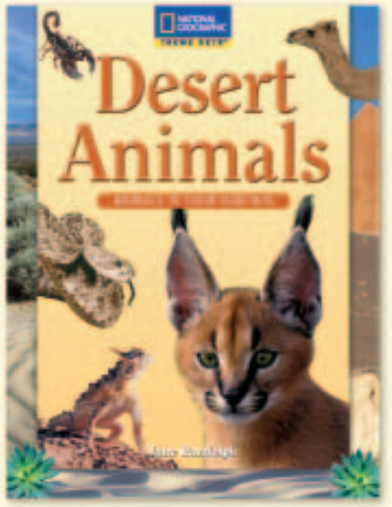
All four books are firmly connected together. They all develop a common set of Key Concepts and core vocabulary. The goal is that all students acquire essential core content at their own reading levels.



Level A



Level B



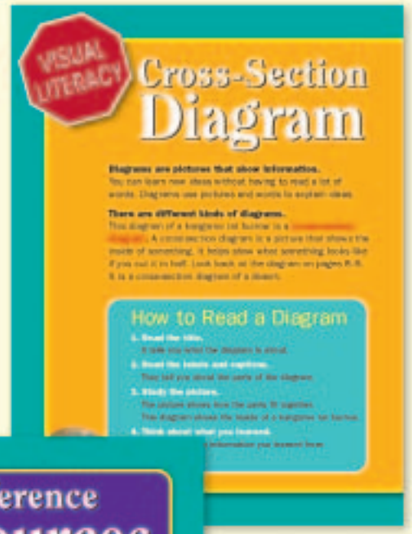
Level C

Level D

Social Studies Themes	Book Titles			
	Level A	Level B	Level C	Level D
A Historical Look at Native Americans	The Nez Perce: People of the Northwest	The Pueblos: People of the Southwest	The Iroquois: People of the Northeast	Cheyenne: People of the Central Plains
Communication Around the World	Telephone	Radio	Television	Internet
Communities and Their Locations	Missoula, Montana	Boston, Massachusetts	St. Louis, Missouri	Honolulu, Hawaii
Cultures and Celebrations	Mexico	Italy	Japan	Egypt
Immigration to the United States	Irish Immigration	Chinese Immigration	Mexican Immigration	German-Jewish Immigration
Inventions Bring Change	The Reaper	The Railroad	Water-Powered Mills	The Cotton Gin
Providing Goods	From Cotton to Blue Jeans	From Trees to Paper	From Wheat to Bread	From Cows to Ice Cream
Trade Across Time and Cultures	Silk	Spices	Salt	Fur

Science Themes	Book Titles			
	Level A	Level B	Level C	Level D
Animals in Their Habitats	Forest Animals	Ocean Animals	Desert Animals	Rain Forest Animals
Cells at Work	Skin	Muscles	Blood	Bone
Energy	Energy in the Home	Energy in the Factory	Energy at the Airport	Energy at the Sports Arena
Extreme Weather	Droughts	Floods	Tornadoes	Hurricanes
Life Cycles	Giant Pandas	Monarch Butterflies	Poison Dart Frogs	Komodo Dragons
Shaping Earth's Surface	Wind	Water	Ice	Earthquakes and Volcanoes
Using Earth's Resources	Indonesia's Rain Forests	Greenland's Ocean Region	Australia's Deserts	Peru's Mountains
Using Simple Machines	Machines in the Home	Machines in Sports	Machines in Construction	Machines in Health

Student Book Features



Visual Literacy

Each ***Theme Set*** includes explicit instruction in one visual literacy skill. Students are shown how to read and use diagrams, maps, graphs, and other examples of visual information.

Genre Study

Each ***Theme Set*** focuses on one nonfiction writing genre form. The genre is defined and explained to students. At the same time, students see how the genre is connected to the subject matter of the ***Theme Set***. Genres covered in the **Theme Sets** program include, biographies, how-to books, compare and contrast article, news report, reference sources, and others.

Research and Write

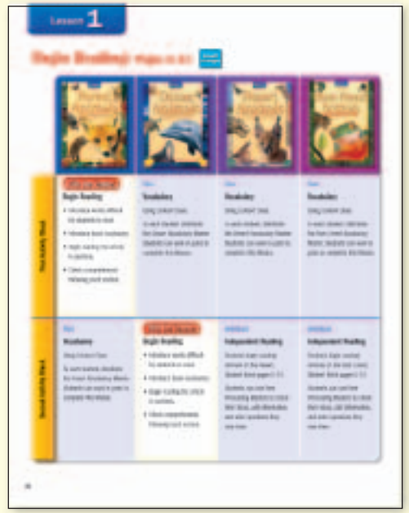
Students have the opportunity to practice their own researching and writing skills by creating their own work based on the genre study they have learned about in the books.

Teacher's Guide Features

Each ***Theme Set*** has a separate Teacher's Guide that provides clear instructional guidelines and comprehensive instructional plans.

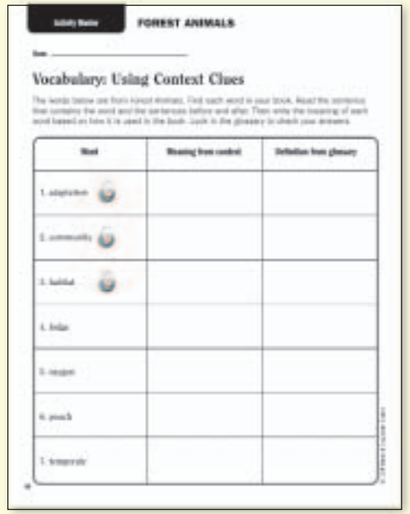
Planning Guides

Each guide contains planning guides to help you effectively manage instructional time.



Lesson Plans

Each guide contains comprehensive lesson plans that help you customize instruction.



Activity Masters

Each guide contains Activity Masters to reinforce core skills and strategies.

Assessment

Each guide contains book-level assessments to help you measure student progress.

Developing Literacy Skills

The **Theme Sets** program supports developing readers and writers by providing appropriate scaffolding and challenges that match the needs of a wide range of students.

Vocabulary

Within each theme, essential content words are targeted as Key Vocabulary and explicitly taught to all students before reading. As students read, they encounter these words repeatedly within rich contexts and have opportunities to use the words in oral and written activities. In addition to the Key Vocabulary covered in all four books, specific book-level words are taught and used in small group and independent activities.

Comprehension

Each theme targets one specific comprehension strategy so that students learn and apply that strategy as they read. These strategies include determining importance, making connections, visualizing, asking questions, making inferences, and synthesizing. Teaching notes provide step-by-step help for explicit instruction, modeling, guided practice, and independent practice.

Visual Literacy

Understanding how to read diagrams, maps, graphs, charts, and other visual aids is critical to comprehending nonfiction. Each theme provides explicit instruction and practice in one kind of visual aid so that students learn how to extract and interpret information that is presented visually.

Text Structure and Genres

For each theme, the characteristics of one nonfiction genre/text structure are explicitly taught in the Genre Study. The second article in each Student Book serves as a model of that genre. Students also apply their understanding of that genre by writing a piece that uses that specific genre as an organizational pattern.

Research and Write

The Research and Write lesson that concludes each book in a theme provides students with an opportunity to show what they have learned. They research additional information about the topic covered in their book and then write in the specific nonfiction form that is the focus of the Genre Study and modeled in the second article.

Flexible Use

Flexibility is a critical factor in the differentiated classroom. The **Theme Sets** program is designed to provide teachers with the flexibility needed to make sure that every child succeeds and has access to core content.

Flexible to Fit a Variety of Programs

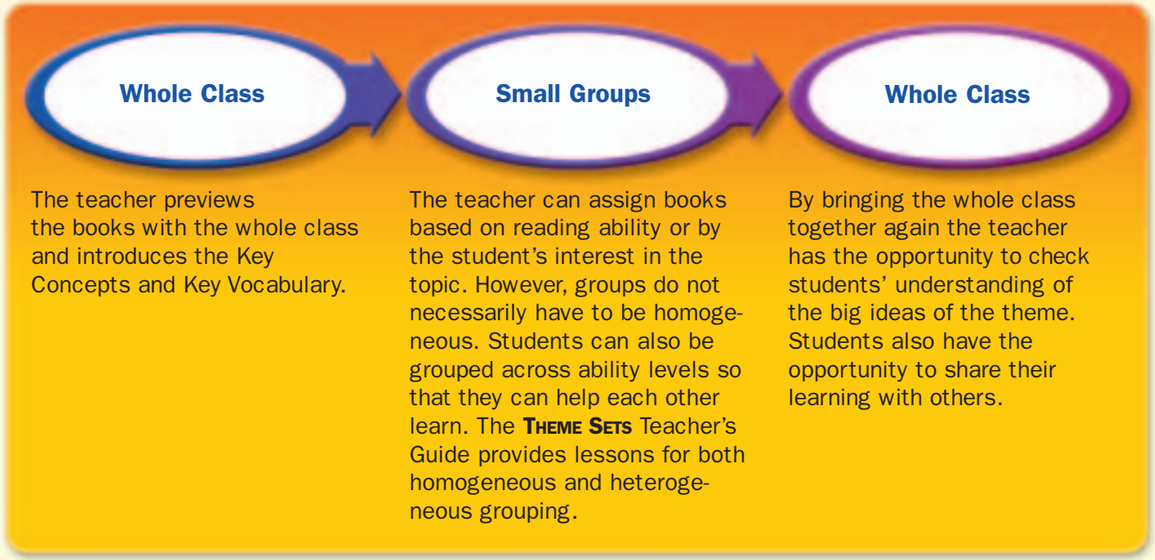
Core instruction: The **Theme Sets** are designed to be used as part of your core curriculum. They provide essential and high interest content for many of the core content areas in science and social studies. Use one or more ***Theme Sets*** instead of content-area texts.

Supplemental: The **Theme Sets** can also be used as a supplement to your content-area texts and reading program. They provide extended opportunities for students to explore core content in depth. Students will also learn more as they read the content at their own reading level.

Tutorial: The **Theme Sets** program is ideally suited to special tutorial programs such as summer school or after school programs. Educators can select those themes that fit their curriculum objectives. The **Theme Sets** program also offers versatility. Each book in a theme is divided into several parts.

Flexible Grouping

The **Theme Sets** program encourages the teacher to use flexible grouping in the classroom.


Whole Class
Small Groups
Whole Class
The teacher previews the books with the whole class and introduces the Key Concepts and Key Vocabulary.
The teacher can assign books based on reading ability or by the student's interest in the topic. However, groups do not necessarily have to be homogeneous. Students can also be grouped across ability levels so that they can help each other learn. The Theme Sets Teacher's Guide provides lessons for both homogeneous and heterogeneous grouping.
By bringing the whole class together again the teacher has the opportunity to check students' understanding of the big ideas of the theme. Students also have the opportunity to share their learning with others.

Pacing Guide

The **Theme Sets** program includes easy-to-follow pacing. This provides the flexibility needed to custom fit instruction to scheduling needs. The following charts show two pacing plans, one for five 90-minute lessons and one for ten 45-minute lessons.

90-minute pacing — 5 Days		Teacher's Guide Pages
Lesson 1		
Day 1:	Introduce the Theme	page 34
	Introduce the Books	page 34–35
	Begin Reading: Pages 6–16 First Activity Block Second Activity Block	pages 36–37
	Check Understanding	page 38
Lesson 2		
Day 2:	Introduce Comprehension Strategy	page 39
	Finish Reading: Pages 6—16 First Activity Block Second Activity Block	pages 40–41
	Check Understanding	page 42
Lesson 3		
Day 3:	Share Learning	page 43
	Think About Key Concept Questions	page 44–45
	Visual Literacy	page 46
Lesson 4		
Day 4:	Introduce Genre Study	page 47
	Begin Reading: Pages 21–26 First Activity Block Second Activity Block	pages 48–49
	Check Understanding	page 50
Lesson 5		
Day 5:	Introduce Key Concept Activities	page 51
	Finish Reading: Pages 21–26 First Activity Block Second Activity Block	pages 52–53
	Check Understanding	page 54
Extend the Learning		
Day 1:	Research and Write	page 55
Day 2:	Research and Write	page 56
Day 3:	Sharing Your Work	page 57

45-minute pacing — 10 Days		Teacher's Guide Pages
Lesson 1		
Day 1:	Introduce the Theme	page 34
	Introduce the Books	page 34–35
	Begin Reading: Pages 6–16 First Activity Block	pages 36–37
Day 2:	Begin Reading: Pages 6–16 Second Activity Block	pages 36–37
	Check Understanding	page 38
Lesson 2		
Day 3:	Introduce Comprehension Strategy	page 39
	Finish Reading: Pages 6–16 First Activity Block	pages 40–41
Day 4:	Finish Reading: Pages 6–16 Second Activity Block	pages 40–41
	Check Understanding	page 42
Lesson 3		
Day 5:	Share Learning	page 43
Day 6:	Think About Key Concept Questions	page 44–45
	Visual Literacy	page 46
Lesson 4		
Day 7:	Introduce Genre Study	page 47
	Begin Reading: Pages 21–26 First Activity Block	pages 48–49
Day 8:	Begin Reading: Pages 21–26 Second Activity Block	pages 48–49
	Check Understanding	page 50
Lesson 5		
Day 9:	Introduce Key Concept Activities	page 51
	Finish Reading: Pages 21–26 First Activity Block	pages 52–53
Day 10:	Finish Reading: Pages 21–26 Second Activity Block	pages 52–53
	Check Understanding	page 54
Extend the Learning		
Day 1:	Research and Write	page 55
Day 2:	Research and Write	page 56
Day 3:	Sharing Your Work	page 57

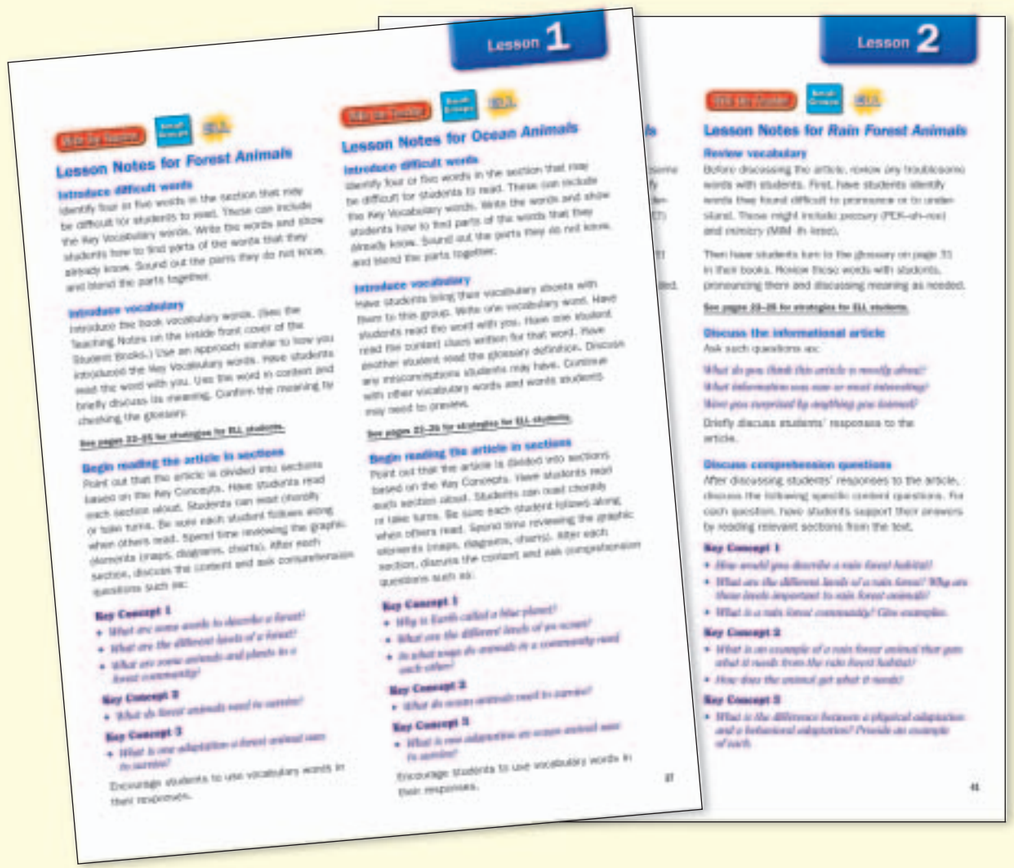
Differentiated Instruction

Although the concept of differentiation is simple, the implementation can be challenging. Differentiation is based on the fact that every child is unique and that classroom instruction should adapt to meet student differences. Many educators agree that instruction should have the flexibility and relevance to address the various readiness levels and learning preferences that are present in every classroom.

The **Theme Sets** program is designed to provide equal access to core content for all students at varying reading levels. The detailed lesson plan encourages flexibility in grouping students. The content provides essential core learning, and the four reading levels provide access for all. Materials are designed so teachers have the tools and information they need to implement a differentiated instructional model.

Flexible Grouping

Students will benefit from a flexible working environment where the teacher includes whole class, small group, and individual instruction that takes into account the ability and readiness of each student in the class.



Essential Core Learning

Every student should have access to the essential literacy, science and social studies content outlined in standards based curriculum. Each of the four books that make up a ***Theme Set*** Unit develops a common set of Key Concepts and core vocabulary. The goal is that each student acquires the same essential information by accessing core content at his or her own reading level.

- The same Key Concepts are developed across all levels.
- All students learn the same Key Vocabulary.
- All students learn the same visual literacy skills.
- All students can contribute to whole class discussions and activities.
- All students learn and apply the same comprehension strategy.
- All students extend their learning as they research and write.
- All students learn about a variety of genres and forms.

By focusing on essential skills and knowledge, students will be able to recall and understand the important elements of the subject they are learning about.

Differentiated Reading

All students should be given the opportunity to access the content at their own level of readiness and ability. The four Student Books in each ***Theme Set*** provide the same critical core content at four different reading levels. The teacher now has materials for struggling readers through fluent readers in her class. Each book presents the material in a variety of ways. By using the text, pictures, and charts, students have several access points to develop their understanding of the material.

Each ***Theme Set*** is accompanied by a comprehensive Teacher's Guide that builds on the best practices in education. The activities vary in complexity, allowing access for all students. Fluent readers are encouraged to work on their own. Readers who need extra help are provided with more scaffolding. Examples of scaffolding used in the **Theme Sets** include explicit instruction, modeling, guided practice, and independent practice.

The Theme Sets vary across levels by

- **increasing the text load and using more complex sentence structure as levels become more challenging.**
- **including vocabulary that grows from simple language to increasingly more difficult words.**
- **expanding concept load as the levels become more challenging.**
- **developing Key Concepts visually as well as verbally.**
- **providing additional picture support at the easier levels.**

Research-Based Instruction

The **Theme Sets** program incorporates best practices that have been identified through research. Practices critical to success in reading and comprehension are highlighted below, as well as ways that the **Theme Sets** support these practices.

Differentiation

"Students who are the same age differ in their readiness to learn, their interests, their styles of learning, their experiences, and their life circumstances."

(Reconcilable Differences? Standards-Based Teaching and Differentiation. Carol Ann Tomlinson. Educational Leadership, Sept. 2000)

- The **Theme Sets** program teaches the same critical core content to every student from struggling to fluent readers.
- Each theme includes four high-interest topics allowing teachers to group their students by reading ability or by interest in the topic.

Appropriate Reading Level

"Effective teachers provide their readers with practice reading materials at their appropriate reading level."

(The Rand Report p.43)

- The **Theme Sets** program provides equal access to science and social studies content for all students at varying reading levels.

Reading in the Content Area

"Teachers who provide comprehension strategy instruction that is deeply connected within the context of subject matter learning, such as history and science, foster comprehension development."

(The Rand Report p.39)

- Each ***Theme Set*** explores a core area of science or social studies content. Students learn strategies to help them access and comprehend the content as they work through the lessons.

Comprehension

"Text comprehension can be improved by instruction that helps readers use specific comprehension strategies."

(Put Reading First p.49)

- Each ***Theme Set*** focuses on one of these six reading comprehension strategies: making connections, asking questions, visualizing, making inferences, determining importance, and synthesizing.

Vocabulary

"Students learn vocabulary directly when they are explicitly taught both individual words and word-learning strategies. Direct vocabulary instruction aids reading comprehension."

(Put Reading First p.35)

- Each ***Theme Set*** has key words that are explicitly taught to all students.
- Each Student Book contains book-level vocabulary words. These words are explicitly taught and repeated often in the text.
- Students are encouraged to use word learning strategies such as context clues and using word parts to determine meaning.

Fluency

"Repeated and monitored oral reading improves reading fluency and overall reading achievement."

(Put Reading First p.24)

- The instructional design of the **Theme Sets** program allows students to repeat reading. The lessons allow time to monitor students' progress.

Genres and Forms

"Students who are aware of text structure organize the text as they read, and they recognize and retain the important information it contains."

(The Rand Report p.40)

- The **Theme Sets** program identifies the characteristics of the major nonfiction genres and forms. These help students develop an understanding of the framework, or schema, for the genre so that new information can be remembered.

Factors Affecting Readability

Teachers can choose from a variety of readability criteria to help make good judgments in choosing appropriate books for students. Yet, as helpful as these criteria might be, no one variable can provide a complete picture of text difficulty.

The four books in each ***Theme Set*** are designed to address the different reading levels within most classrooms. While the Key Concepts are the same across all levels, the texts have been crafted to address the developmental reading needs of a wide range of students.

In determining text difficulty, numerous variables were considered, including nonfiction vocabulary, sentence complexity, concept density, concept complexity, and text density.

Vocabulary	• Vocabulary growth moves from words that are easy, familiar, highly frequent, and usually short, to words that are less common, less frequent,and more abstract or technical. • Multisyllabic words increase as texts become more challenging. • The number of content words highlighted and included in the glossary increases across levels.
Sentence Complexity	• Sentence structure moves from simple, predictable language patterns to more complex patterns with more embedded ideas. • Sentence length increases as levels become more challenging.
Concept Density	• The three Key Concepts in each theme are developed in all levels. • Additional related concepts expand the Key Concepts as the books become more challenging.
Concept Complexity	• Ideas are carefully developed across all levels, but greater prior knowledge is assumed at the more challenging levels. • Concept development at more challenging levels requires more analysis and critical abilities.
Text Density	• The amount of text per page and the length of paragraphs generally increase as books become more challenging. • Easier, more familiar topics, such as animals, may include less text than abstract, less familiar topics, such as energy.

from Level A, *Forest Animals*

Key Concept 4 There are many different habitats on Earth. Animals live in habitats that meet their needs.
What Every Animal Needs
Animals live in habitats that meet their needs. That means that animals live in places where they find shelter. Animals live in places where they can find food and water. They live in places where there is oxygen. That is why a temperate forest is a good habitat for many animals.
Food Turtles eat insects and fruit.
Water Deers drink water from rivers and streams.
Shelter Raccoons live in hollow trees.

from Level D, *Rain Forest Animals*

Key Concept 4 There are many different habitats on Earth. Animals live in habitats that meet their needs.
What Every Animal Needs
Like all animals on Earth, rain forest animals need to have their basic needs fulfilled. They need food, shelter, water, and oxygen for survival. They find all of these things in their rain forest habitats.
In the rain forest, the mixture of rain and heat creates an ideal place for plants to grow. Trees flower and produce seeds all year round. The variety of plant life provides food for many kinds of animals. Some birds, bats, and insects eat only fruit and flower nectar. Other animals, such as sloths and monkeys, eat leaves. The plant-eating animals may, in turn, become food for meat-eating animals. These include jaguars and anacondas.
Finding water is not hard in the rain forest. In such a wet habitat, rivers, streams, and lush plants provide all the water the animals need.
The thick canopy and dense ground foliage of the rain forest shelter many creatures. They help them hide from enemies. Some species have special colors or patterns that help them hide in their plant shelters.
Millions of leaf cutter ants live on the forest floor. They use leaves to grow a special fungus for food.

Comparing the Levels

- **Vocabulary becomes more challenging.**
- **Sentences become more complex.**
- **Same Key Concepts but additional related concepts included in more challenging levels.**
- **Concept development at more challenging levels requires more critical thinking.**
- **Text load increases.**

Placing Students in Levels

Matching books to readers is critical in any successful reading program. Selecting books that students can read and want to read involves ongoing assessment of students' reading abilities, an awareness of students' interests, and the ability to judge the difficulty levels of texts.

Student Reading Ability

Use the assessment tools and student records available in your school district as one source of information to determine a student's individual reading level. Consider also students' reading habits, self-selected reading books, and other information in students' reading portfolios. If you are unsure of the ***Theme Set*** level a student should be reading, you can have a student read the first hundred words to you orally. If the student reads with less than 90 percent accuracy, place the student in an easier level. If the student reads with 95 percent or greater accuracy, place the student in a more difficult level. Reassess student placement periodically.

Student Interest and Motivation

Students who are particularly interested in a topic often bring rich background knowledge to that topic. They are motivated to read more about the topic. This prior knowledge and motivation can allow readers to stretch beyond their overall reading level. In assigning books to students, consider special interest and knowledge. Some students may be interested in reading about a topic in a ***Theme Set*** that is above their reading ability. Provide these students with additional scaffolding and support before, during, and after reading.

Theme Set Reading Levels

The four books in each ***Theme Set*** provide a range of reading levels to facilitate differentiated instruction. However, while Levels A and B are written for struggling readers, they do not look like typical easy-to-read texts. Because of the importance for students to read and learn critical content vocabulary, grade-level content vocabulary was used in Levels A and B. This critical vocabulary was then surrounded by easy-to-read text. Use these guidelines to match students with levels.

Level A
Fry score 2.8

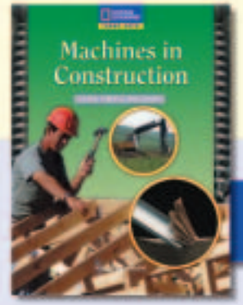
Use Level A with

- students who are reading well below grade level.
- students who generally have limited vocabulary and background knowledge.
- students who generally are most successful with familiar words that are easy to decode and within their oral vocabulary.
- students who are most successful with text that uses short and simple sentence structures with straightforward syntax.
- students who understand content best when the text uses concrete examples to explain concepts.
- students with reading levels that range from 2.6 to 3.5.

Level B
Fry score 3.6

Use Level B with

- students who are reading at or below grade level.
- students who can read two-syllable words that are easy to decode and within their oral vocabulary.
- students who best understand text that uses mostly short, simple sentences with straightforward syntax.
- students who understand concepts that are explained carefully and use some concrete examples.
- students with reading levels that range from 3.5 to 4.5.



Level C
Fry score 5.9

Use Level C with

- students who are reading at or above grade level.
- students who have a good grasp of common vocabulary and are able to use context and other resources to unlock the meaning of technical content words.
- students who can understand simple and most complex sentence structures.
- students who, with appropriate support, can understand abstract concepts.
- students with reading levels that range from 4.8 to 5.9.

Level D
Fry score 6.5

Use Level D with

- students who are your strongest readers.
- students who have well-developed vocabularies and broad background knowledge about a range of topics.
- students who are able to understand most complex sentence structures used in expository writing.
- students who can grasp abstract concepts with appropriate support.
- students with reading levels that range from 6.0 to 6.9.

Supporting English Language Learners

To be successful in mainstream classrooms, students acquiring English need to learn grade-level content as they learn language. The **Theme Sets** provide all students with access to grade-level content in science and social studies while supporting the development of language and literacy skills. The unique instructional design of the **Theme Sets** supports English Language Learners by providing the strategies and scaffolding they need.

Adaptations
An adaptation is something that helps an animal survive in its habitat. An adaptation can be a part of an animal's body. An adaptation can also be how the animal lives or acts.
Some adaptations help animals find food. Some adaptations help animals move around. Some adaptations help animals stay safe.
Finding Food
Moving Around
Staying Safe

Scaffold the Content

Target Key Concepts

English Language Learners benefit from instruction that isolates and makes explicit the big ideas of the lesson. Key Concepts are highlighted on the pages and taught through concrete examples and visuals.

Develop Key Vocabulary

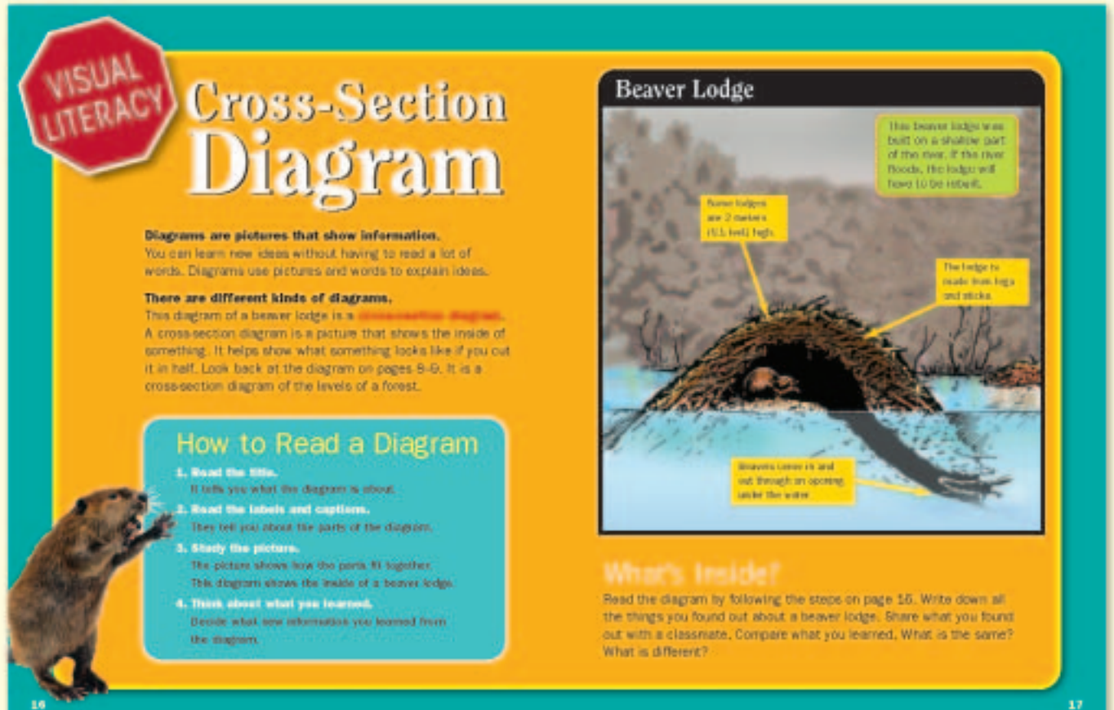
English Language Learners need to build their academic vocabulary to access grade-level content. In the **Theme Sets**, Key Vocabulary is highlighted in the text and defined on the page. Key Vocabulary is repeated frequently.

Provide strong picture support

Striking National Geographic photos and illustrations support the text and concepts in comprehensive ways.

Develop visual literacy skills

Lessons in visual literacy offer explicit instruction on how to understand and interpret information presented in diagrams, maps, charts, and other visuals.


VISUAL LITERACY
Cross-Section Diagram
Diagrams are pictures that show information.
You can learn new ideas without having to read a lot of words. Diagrams use pictures and words to explain ideas.
There are different kinds of diagrams.
This diagram of a beaver lodge is a cross-section diagram.
A cross-section diagram is a picture that shows the inside of something. It helps show what something looks like if you cut it in half. Look back at the diagram on pages 8-9. It is a cross-section diagram of the levels of a forest.
How to Read a Diagram
1. Read the title.
It tells you what the diagram is about.
2. Read the labels and captions.
They tell you about the parts of the diagram.
3. Study the picture.
The picture shows how the parts fit together.
This diagram shows the inside of a beaver lodge.
4. Think about what you learned.
Decide what new information you learned from the diagram.
Beaver Lodge
This beaver lodge was built on a shallow part of the river. If the river floods, the lodge will have to be rebuilt.
The lodge is made from logs and sticks.
What's Inside?
Read the diagram by following the steps on page 16. Write down all the things you found out about a beaver lodge. Share what you found out with a classmate. Compare what you learned. What is the same? What is different?

What Every Animal Needs
Like all animals on Earth, rain forest animals need to have their basic needs fulfilled. They need food, shelter, water, and oxygen for survival. They find all of these things in their rain forest habitats.
In the rain forest, the mixture of rain and heat creates an ideal place for plants to grow. Trees flower and produce seeds all year round. The variety of plant life provides food for many kinds of animals. Some birds, bats, and insects eat only fruit and flower nectar. Other animals, such as sloths and monkeys, eat leaves. The plant-eating animals may, in turn, become food for meat-eating animals. These include jaguars and anacondas.
Finding water is not hard in the rain forest. In such a wet habitat, rivers, streams, and lush plants provide all the water the animals need.
The thick canopy and dense ground foliage of the rain forest shelter many creatures. They help them hide from enemies. Some species have special colors or patterns that help them hide in their plant shelters.

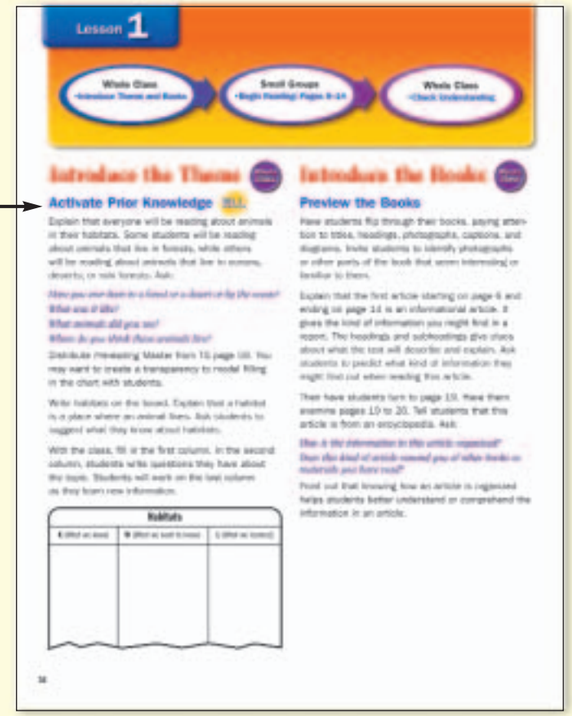
Scaffold the Instruction

Build background

Background knowledge for Key Concepts is carefully developed in the Student Books to ensure that students understand the big ideas.

Activate prior knowledge

The lesson notes for each theme provide detailed suggestions for connecting what students already know to what they are learning.

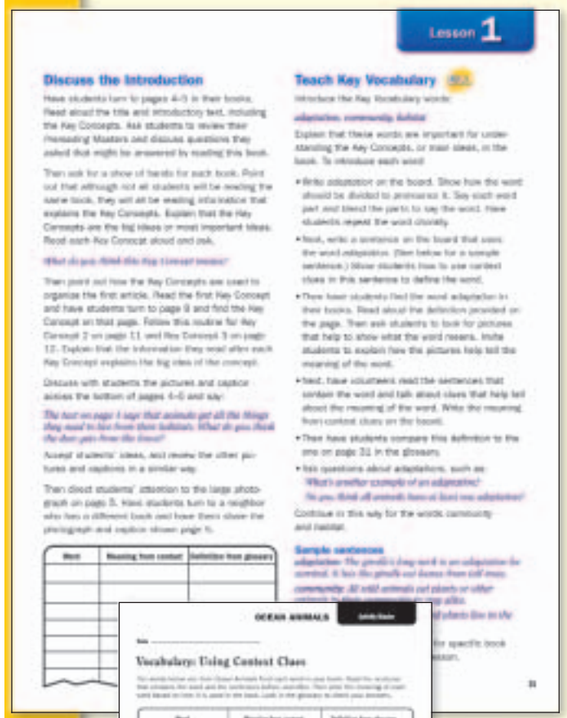


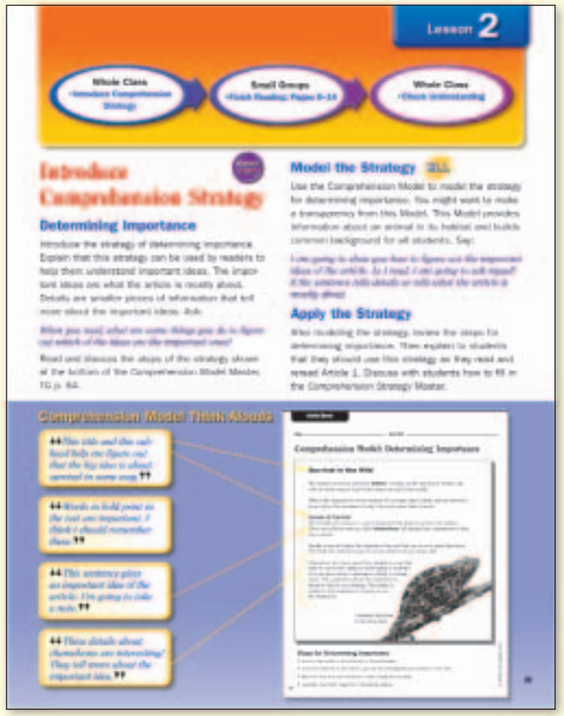
Supporting English Language Learners

Scaffold the Instruction

Teach comprehension strategies

The **Theme Sets** program helps students develop those learning strategies that empower students to become more independent and self-directed in their learning. Each theme provides explicit instruction and practice in one comprehension strategy. Graphic organizers help students use the strategy to understand the content.





Focus on vocabulary

Rapid vocabulary acquisition is critical to academic success for English Language Learners. Not only do English Language Learners need to close the initial vocabulary gap with native speakers, but they must also keep pace with native speakers by steadily expanding their vocabularies. The **Theme Sets** program offers a rich array of instructional opportunities for English Language Learners to acquire academic vocabulary. These include:

Preteach Vocabulary Key Vocabulary is explicitly taught before reading.

Provide a Rich Context for Words New words are embedded in rich context to ensure that students develop a deeper understanding of these words.

Multiple Exposures and Opportunities to Use Words The text of the **Theme Sets** is carefully crafted to ensure repeated use of Key Vocabulary so students see words used in different contexts. Throughout the lessons, students are engaged in activities and games that provide rich opportunities to explore and use new vocabulary words.

Provide for Different Proficiency Levels

The English Language Learners in your class may be at different stages of acquiring English. In accommodating these stages, consider adjusting instruction to provide comprehensible input. Vary student response modes to ensure that all students can participate.

The following descriptions of language acquisition stages are summarized from *Sheltered Content Instruction: Teaching English Language Learners with Diverse Abilities* by Jana Echevarria and Anne Graves (Boston: Allyn & Bacon, 2003), pages 15–19.

Preproduction Level	These students benefit from activities that build listening comprehension and receptive vocabulary while allowing them to respond through nonverbal means. They know almost no vocabulary in English. They communicate with gestures, actions, and a few words. They are building their receptive vocabulary and may experience a "silent period" as they attempt to process the tremendous amount of new information about language, culture, and school.
Early Production	These students benefit from lessons that continue to build vocabulary while encouraging them to produce previously learned language. Students can use one-word and two-word responses and chunks of language, drawing upon an English vocabulary of about a thousand words. They can answer who, what, and where questions with brief responses, and can label and categorize information in English. They communicate more readily in English but may experience "adaptation fatigue" as their frustrations with the new language and culture come to a peak.
Speech Emergence	Students use language purposefully and produce complete sentences. They can successfully participate in English in small-group activities. They may feel continued frustration or experience relief as their knowledge base in English expands. They may actually make more errors as they experiment with more complex language patterns. They may feel conflicted about their cultural identity as they adjust to a new language and cultural environment. They benefit from activities that expand vocabulary and promote higher levels of language use.
Intermediate Fluency	Students can read and write in English and have strong conversational skills. They can produce connected narratives and respond to higher level questions, with errors that are usually in style or usage. They may lag behind in academic tasks, however, especially if they lack academic skills in the home language. They benefit from direct instruction of study skills and learning strategies and from strong contextual support for academic tasks.
Advanced Fluency	These students have become fluent speakers, readers, and writers of English. They can participate fully in classroom activities but may still have gaps in certain academic areas. They will benefit from explicit strategy instruction and continued affirmation of their home cultures.

Assessing Progress

Assessment provides teachers with valuable information to help plan instruction and measure progress over time. An assessment program needs to be ongoing so that changes over time in students' learning can be noted. An assessment program needs to include both formal and informal tools so that evaluation of performance is reliable and useful.

The **THEME SETS** program helps you informally assess student progress in both content-area knowledge and literacy development. The following informal assessment opportunities are built into each ***Theme Set***.

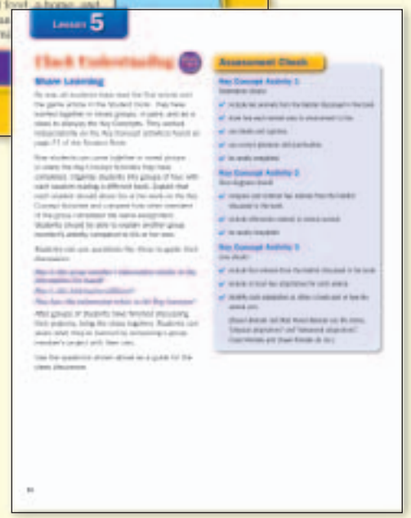
Student Book Assessment Tools

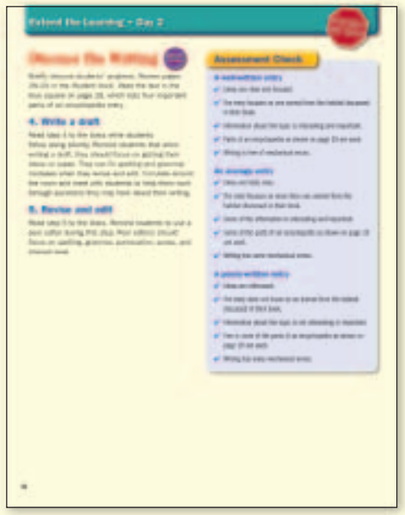
Apply the Key Concepts
Activity
Choose two animals that live in the temperate forest. Draw a picture that shows how each animal does the following:
• finds food
• builds a home
• keeps safe
Use labels and captions to help explain your ideas.
beaver lodge
Activity
Choose two animals that live in the temperate forest. Find out how each of these animals uses plants to live. Then draw a Venn diagram to show what is the same and what is different.
owl
koala
Activity
Choose four animals that live in the forest. Then list at least two adaptations each animal has to help it find food, a home, and protection. Tell whether each adaptation is a body part or how the animal
Forest Animals
1. frog
2.

Think About Key Concept Questions At the end of the first informational article in each ***Theme Set***, a common set of questions taps into the students' knowledge of the three Key Concepts. The Teacher's Guide provides an Assessment Check and sample answers for the four books in each theme. See page 44–45.

Key Concept Activities At the end of the second article, in each ***Theme Set***, three activities provide opportunities for students to demonstrate their understanding of the Key Concepts. These activities tap into the various learning styles. The Teacher's Guide provides an Assessment Check to evaluate student products. See page 54.

Research and Write The writing activity that concludes each book allows students to demonstrate what they have learned about the content as well as produce a specific nonfiction writing form. A rubric for evaluating the writing is provided in the Assessment Check in the Teacher's Guide. See page 56.

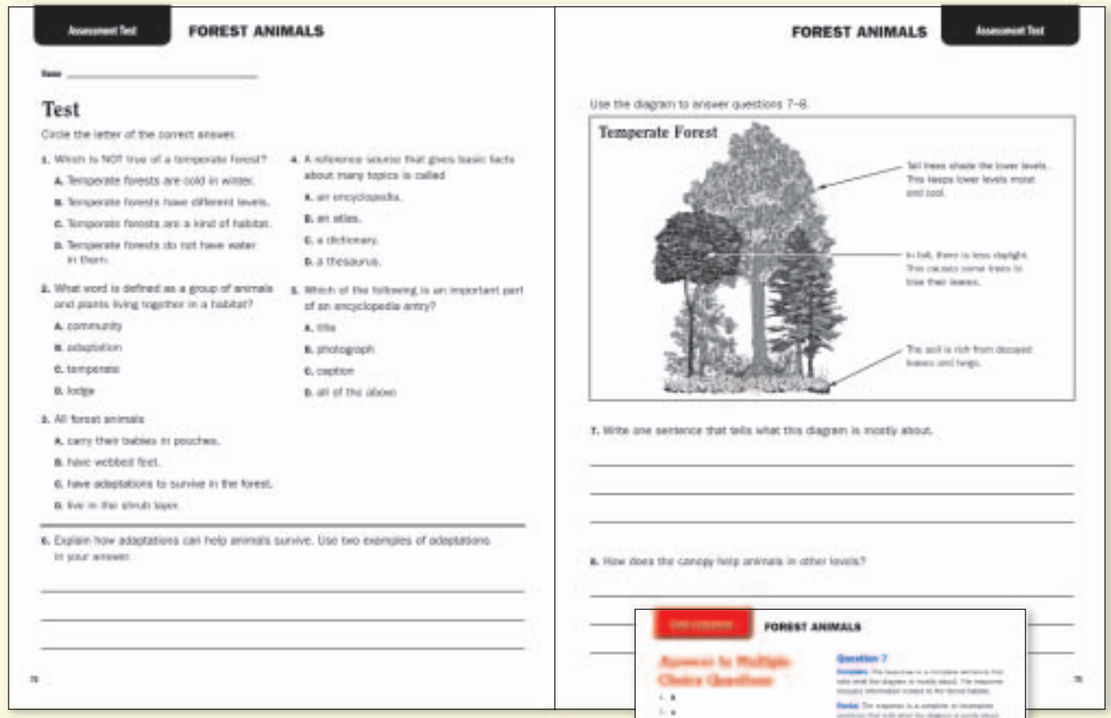




Teacher's Guide Assessment Tools

Open-Book Test In each Teacher's Guide, an Open-Book Test is provided as a blackline master. This test is constructed to help evaluate not only what students have learned but also how effectively students can reread to find specific information. A full answer key is provided for all four books in the theme. See pages 73, and 82–83.

Book Assessment Tests In each Teacher's Guide, a two-page test is provided for each title in the ***Theme Set***. These tests, provided as blackline masters, help to evaluate the content knowledge covered in the theme. The format of the test is similar to the National Assessment of Educational Progress (NAEP) test in that it includes multiple-choice questions, short-constructed responses, and long-constructed responses. A Scoring Guide is provided for each test. See pages 74–81 and 84–87.


Assessment Test
FOREST ANIMALS
Name _____
Test
Circle the letter of the correct answer.
1. Which is NOT true of a temperate forest?
A. Temperate forests are cold in winter.
B. Temperate forests have different levels.
C. Temperate forests are a kind of habitat.
D. Temperate forests do not have water in them.
2. What word is defined as a group of animals and plants living together in a habitat?
A. community
B. adaptation
C. temperate
D. lodge
3. All forest animals
A. carry their babies in pouches.
B. have webbed feet.
C. have adaptations to survive in the forest.
D. live in the shrub layer.
4. A reference source that gives basic facts about many topics is called
A. an encyclopedia.
B. an atlas.
C. a dictionary.
D. a thesaurus.
5. Which of the following is an important part of an encyclopedia entry?
A. title
B. photograph
C. caption
D. all of the above
6. Explain how adaptations can help animals survive. Use two examples of adaptations in your answer.
FOREST ANIMALS
Assessment Test
Use the diagram to answer questions 7–8.
Temperate Forest
Tall trees shade the lower levels. This keeps lower levels moist and cool.
In fall, there is less daylight. This causes some trees to lose their leaves.
The soil is rich from decayed leaves and twigs.
7. Write one sentence that tells what this diagram is mostly about.
8. How does the canopy help animals in other levels?

Extend Your Reading

For additional reading, National Geographic provides many related titles to support ***Using Simple Machines***. Students can use these books for independent reading, for research, or to extend their interest in the subject matter.

Related titles for *Using Simple Machines*

For Research and Further Reading

Windows on Literacy Fluent and Fluent Plus

Mighty Machines (Level 13)

How Does My Bike Work? (Level 14)

Machines Make Fun Rides (Level 16)

Simple Machines (Level 24)

Reading Expeditions

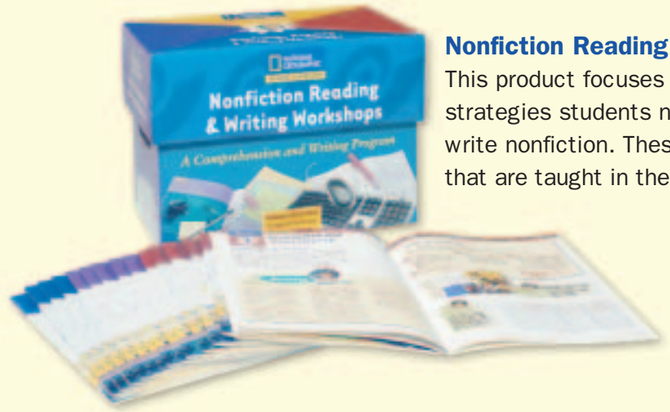
Science Around the House (Fry 3.7, Lexile 500, Guided Reading Level Q-R)

Machines Make it Move (Fry 5.5, Lexile 880, Guided Reading Level V-W)

For Reading and Writing Strategies Practice

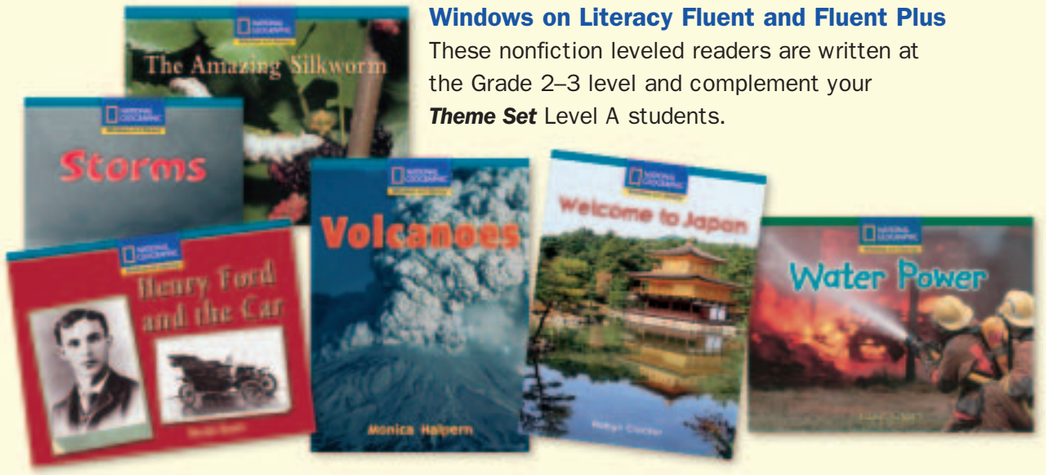
Nonfiction Reading and Writing Workshops

The comprehension strategy of asking questions is taught in *Simple Machines*. For additional instruction and practice, use the *Asking Questions* titles in the Nonfiction Reading and Writing Workshops.



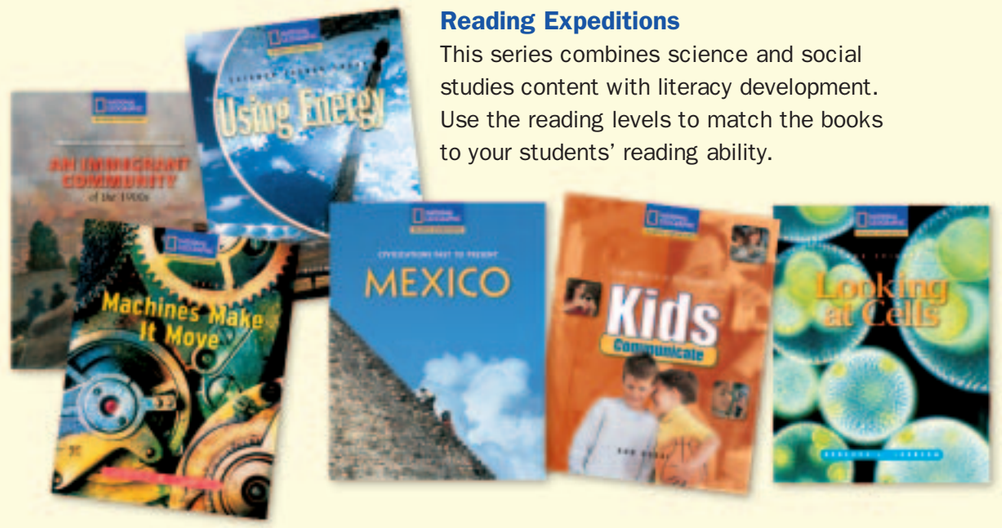
Nonfiction Reading and Writing Workshops

This product focuses on teaching the essential strategies students need to comprehend and write nonfiction. These are the same strategies that are taught in the **Theme Sets** program.



Windows on Literacy Fluent and Fluent Plus

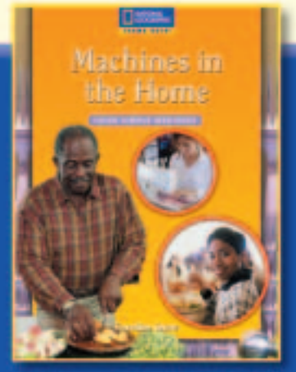
These nonfiction leveled readers are written at the Grade 2–3 level and complement your ***Theme Set*** Level A students.

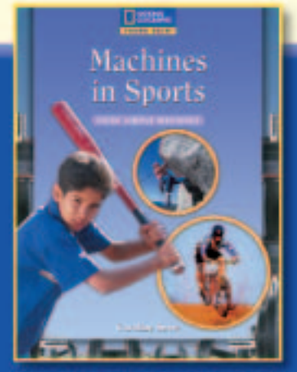


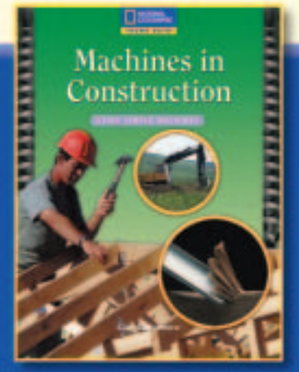
Reading Expeditions

This series combines science and social studies content with literacy development. Use the reading levels to match the books to your students' reading ability.

Using Simple Machines







Same in all books

Key Concepts

Key Concept 1: Machines use force to help people do work.
Key Concept 2: There are six simple machines.
Key Concept 3: Compound machines use two or more simple machines operating together.

Key Vocabulary

compound machines, force, machines, simple machines, work

Literacy Development

Comprehension Strategy
Asking Questions

Visual Literacy Labeled Photograph
Genre Study How-to Books

Writing Activity
Write Your Own User Manual

Varies from book to book

Reading Levels

Least Challenging → **Most Challenging**

As text becomes more challenging:
- Vocabulary and text load increase
- Sentence structure and concepts become more complex

Book Vocabulary

Machines in the Home
fulcrum
inclined plane
lever
load
pulley
screw
thread
wedge
wheel and axle

Machines in Sports
fulcrum
gears
inclined plane
lever
load
pulley
screw
thread
wedge
wheel and axle

Machines in Construction
fulcrum
inclined plane
lever
load
mechanical advantage
pulley
screw
thread
wedge
wheel and axle

Machines in Health
fulcrum
inclined plane
lever
load
mechanical advantage
pitch
pulley
screw
thread
wedge
wheel and axle

Theme Background

Using Simple Machines explains the simple machines that people use every day at home, in sports, in construction, and in health. While each book focuses on a different area where simple machines are used, the same key concepts are developed across books to help students focus on the big ideas.

The theme explores how machines help people do work. It also explains and gives examples of the six different simple machines and discusses how simple machines are put together to make compound machines. Students use the specific content and vocabulary within each book to discuss and examine these big ideas, or Key Concepts.

Each book in this theme includes two articles.

Article 1
Genre: Informational Article Informational articles present information that might be found in a report. Informational articles use headings, subheadings, photographs with labels or captions, boldface words, and diagrams.

Article 2
Genre: How-to Books How-to books give detailed step-by-step instructions for how to do or make something. How-to books use titles, subheads, labels, diagrams, and illustrations to enhance the reader's understanding of the subject matter. This genre enhances students' understanding of the machines described in Article 1.

Literacy Objectives

Article 1
Genre: Informational Article
Text features
- headings
- subheadings
- photographs
- captions
- diagrams

Article 2
Genre: How-to Books
Text features
- title
- subheads
- diagrams
- labels
- illustrations

Comprehension Strategy
Asking Questions

Visual Literacy
Labeled Photograph

Genre Study
How-to Books

Research and Write
Write Your Own User Manual

Correlation to National Standards

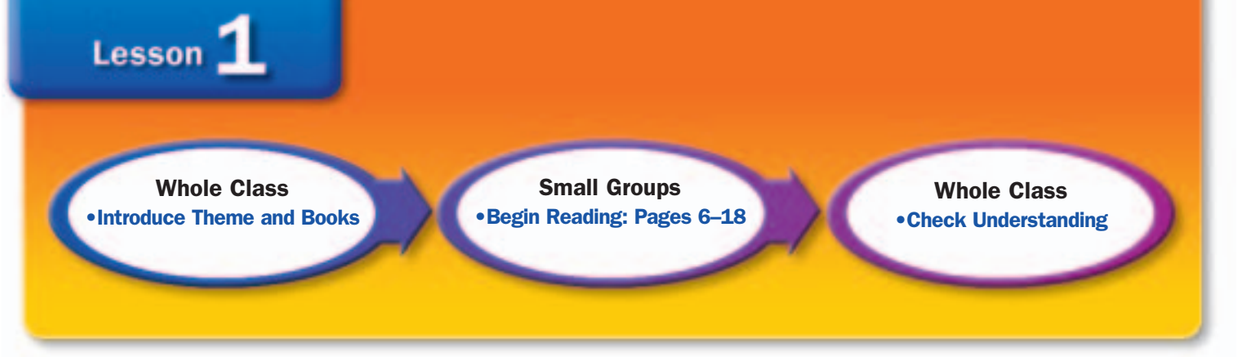
Reading/Language Arts
- Read to be informed
- Apply a wide range of strategies to comprehend and interpret texts
- Use visual and written language to communicate effectively
- Use a variety of informational resources
- Conduct research

Science
- Position and motion of objects (K–4)
- Motions and forces (5–8)
- Science and technology (5–8)
- Scientific inquiry (K–4, 5–8)

At a Glance Planner

See Pacing Guide suggestions on pages 12–13.

Pacing Guide	Student Edition Pages	Activity Masters
Lesson 1 • Activate prior knowledge • Preview the theme and books • Discuss Key Vocabulary • Begin reading the first article	***Using Simple Machines,*** pp. 4–5 **Informational Article,** pp. 6–18	**Prereading:** 3-Column Chart TG p. 59 **Vocabulary:** Definition Chart TG pp. 60–63
Lesson 2 • Teach and apply the comprehension strategy • Finish reading the first article	**Informational Article,** pp. 6–18	**Comprehension Model:** Asking Questions TG p. 64 **Comprehension Strategy:** Asking Questions TG p. 65 **Prereading:** 3-Column Chart TG p. 59 **Word Cards:** *Machines in the Home* TG p. 66 **Word Cards:** *Machines in Sports* TG p. 67
Lesson 3 • Discuss and complete the Key Concept questions • Discuss Visual Literacy	**Think About the Key Concepts,** p. 19 **Visual Literacy:** Labeled Photograph, pp. 20–21	**Key Concept Questions** TG p. 69
Lesson 4 • Discuss the Genre Study (How-to Books) • Begin reading the second article	**How-to Books,** pp. 22–26	**Paired Reading Guide** TG p. 70 **Content Reading Guide** TG p. 71
Lesson 5 • Finish reading the second article • Begin Key Concept Activities	**How-to Books,** pp. 22–26 **Apply the Key Concepts,** p. 27	
Extend the Learning **Day 1** Research and Write **Day 2** Research and Write **Day 3** Sharing Your Work	**Research and Write,** pp. 28–29 **Sharing Your Work,** p. 30	**Prewriting** TG p. 72



Introduce the Theme

Whole Class

Activate Prior Knowledge

ELL

Explain that everyone will be reading about a different place where simple machines are used. Some students will be reading about machines in the home, while others will be reading about machines in sports, machines in construction, or machines in health. Ask:

What are some machines that you use every day?
How do these machines help you get things done?

Distribute the *Prereading* Master found in this Teacher's Guide, page 59. You may want to create a transparency to model filling in the Master with students.

Write *machines* on the board. Explain that machines are tools that help us do work. Ask students to suggest what they know about machines.

With the class, make a 3-column chart about machines. In column 1, students can list machines they use. In column 2, they can explain how the machine helps them do work. At the end of Lesson 1, students can add to columns 1 and 2 and fill in column 3, listing whether each machine is simple or compound. They can continue to add words and phrases to their charts as they learn new information about the topics.

Machine	How this machine helps us do work	Simple/Compound

Introduce the Books

Whole Class

Preview the Books

Have students flip through their books, paying attention to titles, headings, photographs, captions, diagrams, and labels. Invite students to identify photographs or other parts of the book that seem interesting or familiar to them.

Explain that the first article starting on page 6 and ending on page 18 is an informational article. It gives the kind of information you might find in a report. The headings and subheadings give clues about what the text will describe and explain. Ask students to predict what kind of information they might find out when reading this article.

Then have students turn to page 23. Have them examine pages 23 to 26. Tell students that this article is a user manual. Ask:

How is the information in this article organized?
Does this kind of article remind you of other books or materials you have read?

Point out that knowing how an article is organized helps students better understand the information in an article.

Discuss the Introduction

Have students turn to pages 4–5 in their books. Read aloud the title and introductory text, including the Key Concepts. Ask students to review their *Prereading* Masters and discuss any questions they may have that might be answered by reading this book.

Then ask for a show of hands for each book. Point out that although not all students will be reading the same book, they all will be reading information that explains the Key Concepts. Explain that the Key Concepts are the big ideas or most important ideas. Read each Key Concept aloud and ask:

What do you think this Key Concept means?

Then point out how the Key Concepts are used to organize the first article. Read the first Key Concept and have students turn to page 8 and find the Key Concept on that page. Follow this routine for Key Concept 2 on page 10 and Key Concept 3 on page 16. Explain that the information they read after each Key Concept explains the big idea of the concept.

Discuss with students the pictures and captions across the bottom of pages 4–5 and say:

The text on page 4 says that machines help us do things more easily. How does the machine in the first picture help you?

Accept students' ideas, and review the other pictures and captions in a similar way.

Then direct students' attention to the large photograph on page 5. Have students turn to a neighbor who has a different book and have them share the photograph and caption shown on page 5.

Word	Definition	Examples or Description	Nonexamples

Teach Key Vocabulary

ELL

Introduce the Key Vocabulary words:

compound machines, force, machines, simple machines, work

Explain that these words are important for understanding the Key Concepts, or main ideas, in the book. To introduce each word:

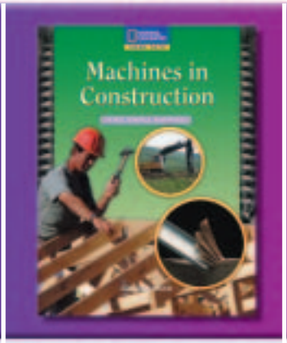
- Write *machines* on the board. Show how the word should be divided to pronounce it. Say each word part and blend the parts to say the word. Have students repeat the word chorally.
- Draw a chart with 4 columns on the board.
- Have students skim the first article to find the word *machines* in green print on page 9. Write *machines* in the first column of the chart.
- Next, ask students to look the word up in the glossary on page 31 of their books and read the definition. Ask a volunteer to restate the definition in his or her own words. Write this definition in the second column of the chart.
- Have students hunt through their books to find words that describe or are synonyms for the vocabulary word. Write these words in the third column of the chart. Some examples might be *tools, devices, make jobs easier*.
- Students can then look for examples of what the word is not. Write these words in the fourth column of the chart. Some nonexample words for *machines* might be *food, home*, or *amount*.
- Then ask students to look for pictures in their books that help to show what the word means. Invite students to point to or explain which pictures help them understand the meaning of the word or relate to the word.

Continue in this way for the words *compound machines, force, simple machines*, and *work*. For instance, what are some words that describe compound machines? What is a nonexample of a compound machine?

Students will use this definition chart for specific book vocabulary words later in this Lesson.

Begin Reading: Pages 6–18

Small Groups



First Activity Block

With the Teacher

Begin Reading

- Introduce words difficult for students to read.
- Introduce book vocabulary.
- Begin reading the article in sections.
- Check comprehension following each section.

Pairs

Vocabulary

Definition Chart

To each student, distribute the *Machines in Sports Vocabulary* Master. Students can work in pairs to complete this Master.

Pairs

Vocabulary

Definition Chart

To each student, distribute the *Machines in Construction Vocabulary* Master. Students can work in pairs to complete this Master.

Pairs

Vocabulary

Definition Chart

To each student, distribute the *Machines in Health Vocabulary* Master. Students can work in pairs to complete this Master.

Second Activity Block

Pairs

Vocabulary

Definition Chart

To each student, distribute the *Machines in the Home Vocabulary* Master. Students can work in pairs to complete this Master.

With the Teacher

Begin Reading

- Introduce words difficult for students to read.
- Introduce book vocabulary.
- Begin reading the article in sections.
- Check comprehension following each section.

Individuals

Independent Reading

Students begin reading *Machines in Construction*, Student Book pages 6–18.

Students can use their *Prereading* Master to check their ideas, add information, and write questions they may have on the back of the page.

Individuals

Independent Reading

Students begin reading *Machines in Health*, Student Book pages 6–18.

Students can use their *Prereading* Master to check their ideas, add information, and write questions they may have on the back of the page.

With the Teacher Small Groups ELL

Lesson Notes for *Machines in the Home*

Introduce difficult words

Identify four or five words in the section that may be difficult for students to read. These can include the Key Vocabulary words if needed. Write the words and show students how to find parts of the words that they already know. Sound out the parts they do not know, and blend the parts together.

Introduce vocabulary

Introduce the book vocabulary words. (See the Teaching Notes on the inside front cover of the Student Books.) Use an approach similar to how you introduced the Key Vocabulary words. Have students read the word with you. Check the glossary for the word's meaning. Then have volunteers offer words that describe the word and some nonexamples of the word.

See pages 22–25 for strategies for ELL students.

Begin reading the article in sections

Point out that the article is divided into sections based on the Key Concepts. Have students read each section aloud. Students can read chorally or take turns. Be sure each student follows along when others read. Spend time reviewing the graphic elements (diagrams, labels, photographs, and captions). After each section, discuss the content and ask comprehension questions such as:

Key Concept 1

- *How does force help you do work?*
- *What are some examples of times you use force?*

Key Concept 2

- *What are the six simple machines?*
- *How does each simple machine work?*

Key Concept 3

- *What are some examples of compound machines?*
- *What are the simple machines that make up each of these compound machines?*

Encourage students to use vocabulary words in their responses.

With the Teacher Small Groups ELL

Lesson Notes for *Machines in Sports*

Introduce difficult words

Identify four or five words in the section that may be difficult for students to read. These can include the Key Vocabulary words if needed. Write the words and show students how to find parts of the words that they already know. Sound out the parts they do not know, and blend the parts together.

Introduce vocabulary

Have students bring their vocabulary sheets with them to this group. Write one vocabulary word on the board. Have students read the word with you. Have one student read the glossary definition. Then have volunteers offer words that describe the word and some nonexamples of the word. Discuss any misconceptions students may have. Continue with other vocabulary words and words students may need to preview.

See pages 22–25 for strategies for ELL students.

Begin reading the article in sections

Point out that the article is divided into sections based on the Key Concepts. Have students read each section aloud. Students can read chorally or take turns. Be sure each student follows along when others read. Spend time reviewing the graphic elements (diagrams, labels, photographs, and captions). After each section, discuss the content and ask comprehension questions such as:

Key Concept 1

- *How does force help you do work?*
- *What are some examples of times you use force?*

Key Concept 2

- *What are the six simple machines?*
- *How does each simple machine work?*

Key Concept 3

- *What are some examples of compound machines?*
- *What are the simple machines that make up each of these compound machines?*

Encourage students to use vocabulary words in their responses.

Lesson 1

Check Understanding

Whole Class

Share Learning

By now, all students have read most of the informational article, either independently or in small groups with the teacher.

Bring the class together, and have students share what they learned from the books in this theme. Ask:

What place where machines are used did you read about?

What are some of the ways we use machines in these places?

What are the big ideas in the article?

Discuss the Key Concepts

ELL

Students reading different books can explain how the Key Concepts apply to the individual topics. Students will begin to see how the same big ideas apply to simple and compound machines in general.

Review the Key Concepts with the class using a web graphic organizer. Ask a volunteer to say the area where machines are used that he or she read about in the informational article. Write the name of this area in the center of the web. Ask the class:

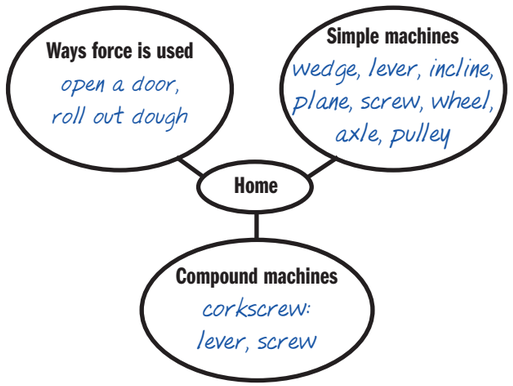
What are some ways force is used in this area?

What are the simple machines used in this area?

What is one compound machine used in this area?

What simple machines make up this compound machine?

Continue in this way until a web is made for each of the four titles. Help students make connections between the big ideas of the theme and each title.



Sample web for Energy in the Home

Revisit the *Prereading* Master

Now that students have read most of Article 1, have them revisit the *Prereading* Master they began at the beginning of the Lesson. Students can work in pairs or independently to compare what they have written and to get new ideas to add to their charts. They can also begin labeling each machine as simple or compound in the third column of the chart.

Lesson 2

Whole Class
•Introduce Comprehension Strategy

Small Groups
•Finish Reading: Pages 6–18

Whole Class
•Check Understanding

Introduce Comprehension Strategy

Whole Class

Asking Questions

Introduce the strategy of asking questions. Explain that readers can use this strategy to help them make sense of what they are reading. Asking questions will make the text easier to understand. Ask:

When you read something, do you sometimes ask questions in your head about something you want to know more about or do not understand?

Read and discuss the steps of the strategy shown at the bottom of the *Comprehension Model* Master, TG p. 64.

Model the Strategy

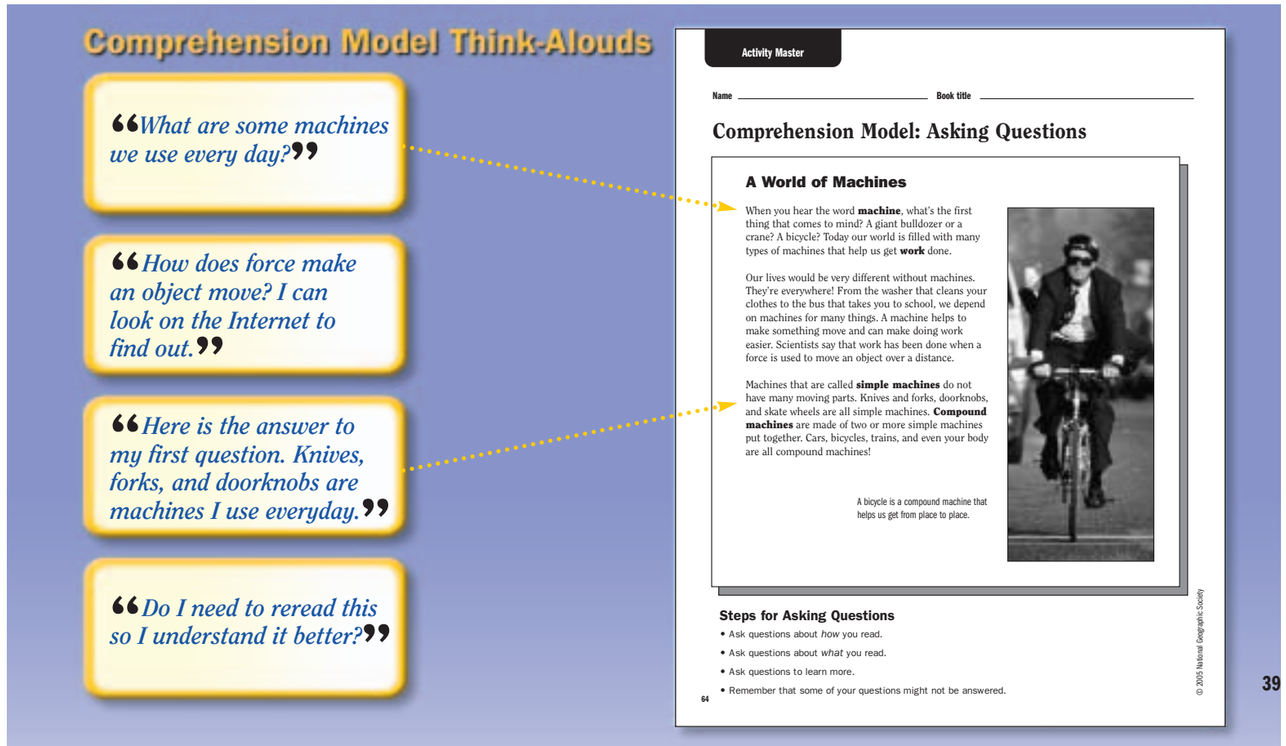
ELL

Use the Comprehension Model to model the strategy for asking questions. You might want to make a transparency from this Model. This Model provides information about machines and builds common background for all students. Say:

I am going to show you how to ask questions about what you are reading. As I read, I am going to stop and ask questions to help me understand what I am reading.

Apply the Strategy

After modeling the strategy, review the steps for asking questions. Then explain to students that they should use this strategy as they read and reread Article 1. Discuss with students how to practice the comprehension strategy, using the *Comprehension Strategy* Master.


Comprehension Model Think-Alouds
"What are some machines we use every day?"
"How does force make an object move? I can look on the Internet to find out."
"Here is the answer to my first question. Knives, forks, and doorknobs are machines I use everyday."
"Do I need to reread this so I understand it better?"
Activity Master
Name
Book title
Comprehension Model: Asking Questions
A World of Machines
When you hear the word machine, what's the first thing that comes to mind? A giant bulldozer or a crane? A bicycle? Today our world is filled with many types of machines that help us get work done.
Our lives would be very different without machines. They're everywhere! From the washer that cleans your clothes to the bus that takes you to school, we depend on machines for many things. A machine helps to make something move and can make doing work easier. Scientists say that work has been done when a force is used to move an object over a distance.
Machines that are called simple machines do not have many moving parts. Knives and forks, doorknobs, and skate wheels are all simple machines. Compound machines are made of two or more simple machines put together. Cars, bicycles, trains, and even your body are all compound machines!
A bicycle is a compound machine that helps us get from place to place.
Steps for Asking Questions
• Ask questions about how you read.
• Ask questions about what you read.
• Ask questions to learn more.
• Remember that some of your questions might not be answered.
64
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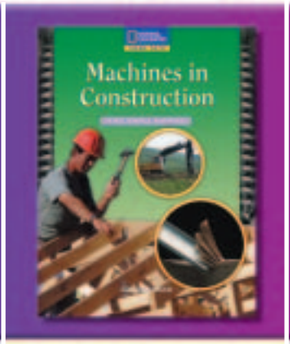
Finish Reading: Pages 6–18

Small Groups



First Activity Block

Pairs

Word Card Activity

Pairs of students reading *Machines in the Home* can use the word cards found on page 66 of this Teacher's Guide as flash cards to practice reading the words and saying the definitions. Using these word cards, students gain experience using Key Vocabulary words and vocabulary words for *Machines in the Home*.

Pairs

Finish Reading/Reread

Students can work with a partner to finish reading *Machines in Sports*, Student Book pages 6–18.

Students then reread the article with a partner and complete the *Comprehension Strategy* Master.

With the Teacher

Discuss Reading

- Review vocabulary.
- Discuss the article.
- Discuss comprehension questions.

Individuals

Finish Reading/Reread

Students finish reading *Machines in Health*, Student Book pages 6–18.

Students then reread the article and complete the *Comprehension Strategy* Master.

Second Activity Block

Pairs

Finish Reading/Reread

Students can work with a partner to finish reading *Machines in the Home*, Student Book pages 6–18.

Students then reread the article with a partner and complete the *Comprehension Strategy* Master.

Pairs

Word Card Activity

Pairs of students reading *Machines in Sports* can use the word cards found on page 67 of this Teacher's Guide as flash cards to practice reading the words and saying the definitions. Using these word cards, students gain experience using Key Vocabulary words and vocabulary words for *Machines in Sports*.

Individuals

Finish Reading/Reread

Students finish reading *Machines in Construction*, Student Book pages 6–18.

Students then reread the article and complete the *Comprehension Strategy* Master.

With the Teacher

Discuss Reading

- Review vocabulary.
- Discuss the article.
- Discuss comprehension questions.

With the Teacher Small Groups ELL

Lesson Notes for *Machines in Construction*

Review vocabulary

Before discussing the article, review any troublesome words with students. First, have students identify words they found difficult to pronounce or to understand.

Then have students turn to the glossary on page 31 in their books. Review these words with students, pronouncing them and discussing meanings as needed.

See pages 22–25 for strategies for ELL students.

Discuss the informational article

Ask questions such as:

What do you think this article is mostly about?
What information was new or most interesting?
Were you surprised by anything you learned?

Briefly discuss students' responses to the article.

Discuss comprehension questions

After discussing students' responses to the article, discuss the following specific content questions. For each question, have students support their answers by reading relevant sections from the text.

Key Concept 1

- *How does force help you do work?*
- *What are some examples of times you use force?*

Key Concept 2

- *What are the six simple machines?*
- *How does each simple machine work?*

Key Concept 3

- *What are some examples of compound machines?*
- *What are the simple machines that make up each of these compound machines?*

With the Teacher Small Groups ELL

Lesson Notes for *Machines in Health*

Review vocabulary

Before discussing the article, review any troublesome words with students. First, have students identify words they found difficult to pronounce or to understand.

Then have students turn to the glossary on page 31 in their books. Review these words with students, pronouncing them and discussing meanings as needed.

See pages 22–25 for strategies for ELL students.

Discuss the informational article

Ask questions such as:

What do you think this article is mostly about?
What information was new or most interesting?
Were you surprised by anything you learned?

Briefly discuss students' responses to the article.

Discuss comprehension questions

After discussing students' responses to the article, discuss the following specific content questions. For each question, have students support their answers by reading relevant sections from the text.

Key Concept 1

- *How does force help you do work?*
- *What are some examples of times you use force?*

Key Concept 2

- *What are the six simple machines?*
- *How does each simple machine work?*

Key Concept 3

- *What are some examples of compound machines?*
- *What are the simple machines that make up each of these compound machines?*

Lesson 2

Check Understanding

Whole Class

Review the Comprehension Strategy

Remind students that when they read, they use different strategies to help them better understand what they read. Review with them the strategy of asking questions.

- **Ask questions about *how* you read.**
- **Ask questions about *what* you read.**
- **Ask questions to learn more.**
- **Remember that some of your questions might not be answered.**

Select a sample passage from one of the four books and model thinking aloud as you read the passage. You could also reuse the *Comprehension Model* Master.

Then review with the class their completed *Comprehension Strategy* Master. To begin, have students work in pairs. Suggest that students review their *Comprehension Strategy* Master notes and select one example of a question they asked. Ask them to read aloud to their partners the passage that contains the text they used to ask their questions.

After students have practiced thinking aloud to ask questions, ask volunteers to model this process for the class. Be sure to include students who are reading each of the four books.

Comprehension Strategy Tips

Collect ideas about how students can use the comprehension strategy of asking questions in their reading. Record their ideas on chart paper and post the chart so that students can refer to it when they read other informational articles of this kind. Leave some space at the bottom for additional tips as they come up.

Here is a list of tips that the class might include.

Asking Questions

- **Ask questions to learn more about the topic.**
- **Don't worry about asking dumb questions. There are no dumb questions.**
- **Ask questions about how you're reading to check up on yourself.**
- **Ask questions about what you're reading so you know you get it.**
- **Reread, read on, or look for information to answer your questions.**
- **Don't worry if you can't answer all your questions.**

Lesson 3

Whole Class
•Share Learning

Whole Class
•Think About Key Concept Questions

Whole Class
•Visual Literacy

Share Learning

Whole Class

Review the Key Concepts with the class. Remind students that they have all read an article about the simple and compound machines found in different places, and they have all read about the same Key Concepts. Explain that now students can share what they have learned from their books. Say:

First, we will work in small groups to discuss what we learned about simple and compound machines. Then we will come together again to share what we learned with the class.

Next, distribute the *Share Learning* Master found on page 68 of this Teacher's Guide. Then organize students into groups of four, with each student reading a different book. Explain that each student is the group's "expert" on his or her book's information. Group members then complete this *Share Learning* Master together, as each student contributes ideas to complete the chart.

After groups of students have completed their charts, bring the class together to create a class chart on the board. Students can share what they've learned from their own books as well as from other students in their group. Ask questions to help students make connections to the big ideas among titles.

Assessment Check

Students should conclude that

- ✔ there are many ways force is used to do work.
- ✔ there are six simple machines.
- ✔ compound machines have more parts and are more complex than simple machines.

Area where machines are used	Ways force is used in this area	The six simple machines/ Examples	Examples of compound machines
In the home	open a door, roll out pizza dough	wedge (axe), lever (seesaw), inclined plane (ramp), screw (jar), wheel and axle (doorknob), pulley (outdoor umbrella)	corkscrew, faucet, sewing machine
In sports	kicking a ball, swimming, jumping rope	wedge (arrowhead), lever (oar), inclined plane (ramp), screw (barbell), wheel and axle (steering wheel), pulley (weights machine)	bicycle, sailboat, pitching machine
In construction	hammering a nail, laying a concrete slab, lifting a beam	wedge (nail), lever (hammer), inclined plane (ramp), screw (screw), wheel and axle (screwdriver), pulley (pulley)	shovel, cement mixer, crane
In health	wrapping a bandage, removing a splinter, making an incision	wedge (scalpel), lever (forceps), inclined plane (ramp), screw (screw), wheel and axle (oxygen tank), pulley (exercise machines)	surgical scissors, prosthetic arm, wheelchair

Sample answers for one group of students

Think About Key Concept Questions

Whole Class

Have students turn to page 19 in their Student Books. On this page, all students will find the same four questions relating to the Key Concept statements.

Think About the Key Concepts

1. **What are three things that force can do to an object? Give an example of each.**
2. **In science, what is the connection between force and work?**
3. **Name the six simple machines. Explain how each one can help people work.**
4. **Give two examples of compound machines. Explain how they help people work.**

Read the questions to the class, making sure that students understand each question. You might ask volunteers to rephrase the question in their own words, or you might rephrase the questions for students.

Share Learning

Explain to students that they will complete the *Key Concept Questions* Master independently. Then students will come together as a class to share what they have learned. Say:

You have each read an article about how machines are used. Not everyone has read the same book, but all books have the same Key Concepts. Now, as you complete the Key Concept Questions *Master, think about what you've learned from reading.*

When we come together as a class to discuss the completed Key Concept Questions *Masters, you can compare what you have learned to what others have learned about how machines are used.*

Review the *Key Concept Questions* Master with students, answering any questions they may have.

Assessment Check

Students should address these main ideas in their responses to the Key Concept questions:

1. Force can cause an object to move, stop, or change.
2. Work is what is done when force moves, stops, or changes the position of an object.
3. The six simple machines are: wedge, lever, inclined plane, screw, wheel and axle, and pulley.
4. There are a variety of compound machines that help people do work.

Possible Responses to Key Concept Questions

Machines in the Home	Machines in Sports	Machines in Construction	Machines in Health
1. What are three things that force can do to an object? Give an example of each.			
Force can make an object move, stop, or change. Pushing a door makes it move, stopping the door from slamming makes it stop, and rolling out piz-z-a dough changes it.	Force can make an object move, stop, or change. Kicking a ball makes it move, catching a ball makes it stop, and swimming changes the movement of the water.	Force can make an object move, stop, or change. The hammer makes the nail move, the wood stops the nail's movement, and flattening the concrete changes its shape.	Force can make an object move, stop, or change. Pushing a wheelchair moves the patient, pressing a bandage on a cut stops the blood flow, and setting a bone changes its position.
2. In science, what is the connection between force and work?			
Work is the result of force. Force is what moves, changes, or stops the movement of an object.	Work is the result of force. Force is what moves, changes, or stops the movement of an object.	Work is the result of force. Force is what moves, changes, or stops the movement of an object.	Work is the result of force. Force is what moves, changes, or stops the movement of an object.
3. Name the six simple machines. Explain how each one can help people work.			
A wedge can help people cut wood. A lever can reduce the force of a load. An inclined plane can help people move loads up and down. A screw can keep a lid on a jar. The wheel and axle of a doorknob can help people open and close a door. A pulley can help people open an outdoor umbrella.	A wedge can help an arrow pierce a target. A lever can help people row a boat. An inclined plane can help people do skateboard tricks. A screw can keep weightlifting equipment together. The wheel and axle of a doorknob can help change a car's direction. A pulley can help people move weights on a weight machine.	A wedge can help a nail move into wood. A lever can help people hammer a nail. An inclined plane can help people move loads up and down. A screw driver can help a screw twist into wood. The wheel and axle of a screw-driver can help people insert a screw. A pulley can help people lift a heavy load.	A wedge can help people pierce something. A lever can reduce the amount of force needed to do something. An inclined plane can help people move loads up and down. A screw can keep broken bones together. The wheel and axle of an oxygen tank can help people open the tank. A pulley can help people lift a heavy load.
4. Give two examples of compound machines. Explain how they help people work.			
A corkscrew helps people open bottles. A faucet helps people get running water. A sewing machine helps people sew faster.	A bicycle helps people get somewhere faster. A sailboat helps people move through the water. A pitching machine throws balls at a baseball player.	A shovel helps people dig. A cement mixer helps people make cement. A crane helps people lift and move very heavy loads.	Surgical scissors help people cut thread. A prosthetic arm helps a person who lost his or her arm. A wheelchair helps someone who cannot walk move around.

Lesson 3

Visual Literacy

Whole Class

Labeled Photograph

Have students turn to page 20 in their books. In all books, this page contains the same information about labeled photographs, except that the topic of each diagram is specific to each book. Say:

I am going to read pages 20 and 21 from Machines in the Home. *This book shows a labeled photograph of a can opener. Since you are not all reading the same book, you do not have the same labeled photographs on this page. But the information about labeled photographs is the same.*

After reading the top half of page 20, review the definition of a labeled photograph.

Then read the four steps in the box at the bottom of page 20. After reading the text in the box, have students look back at the labeled photographs on pages 10–18 of their books. Say:

While you are looking at the labeled photographs in your specific book, I'm going to look at pages 10–18 in Machines in the Home. *We've all seen these labeled photographs already, since we've all read this article. Let's look at these labeled photographs a little more closely now.*

Model the process of reading the labeled photographs on pages 10–18 in *Machines in the Home*. Focus on the titles, photographs, and labels.

Discuss how using labeled photographs like these can help students clarify their understanding of concepts and terms. Ask questions such as:

Find a labeled photograph in your book. What is one term or idea that was easier to understand after using this labeled photograph?

Have at least one student reading each of the books suggest answers.

Next, have students turn back to pages 20 and 21 in their books. Reread the three steps in the box at the bottom of page 20. As you read each step to the class, use the labeled photograph on page 21 as a model. Continue to use examples from *Machines in the Home*, but ask volunteers reading other books to offer similar information. For example:

1. Read the title.

Say: *The title tells me what the labeled photograph shows. The title,* Can Opener, *means this labeled photograph shows a can opener.*

2. Study the labels and the caption.

Say: *By reading the labels and captions, I can learn more information about the photograph. This caption tells me that a can opener is a compound machine. The labels point out simple machines that make up a can opener.*

3. Study the photograph.

Say: *By carefully reviewing this photograph, I can see examples of simple machines. For example, I can see that this sharp part is a wedge. This helps me to understand more about wedges.*

Next, read the text at the bottom of page 21. Give students five minutes to write down ideas they have about the photograph. Then have a brief class discussion about students' ideas related to the photograph.

Lesson 4

Introduce Genre Study

Whole Class

How-to Books

Explain to students that authors have varied purposes for writing. Authors can choose the writing form that best suits the purpose for writing. These different forms of writing are called genres. Say:

Writers use different forms, or genres, depending on their purpose for writing. Today we are going to learn about a genre, or type of writing, called how-to books. How-to books tell you how to do or make something.

Then have students turn to page 22 of their books. Read page 22 to the class. Say:

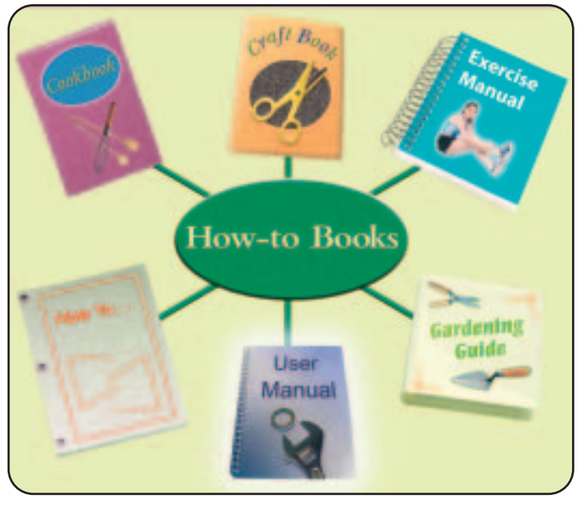
Look at this diagram. It shows six different types of how-to books. Each of these how-to books can be used for different purposes. For example, a cookbook can be used to find out how to make a certain recipe. Why might you use a craft book?

Continue in this way with each how-to book shown so that students understand at least one use for each type.

Next, have students turn to page 23. Explain to students that they will be reading a how-to book called a user manual.

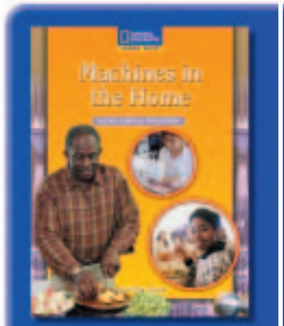
Then read and discuss the different labels shown on page 23, which identify and describe some parts of a user manual.

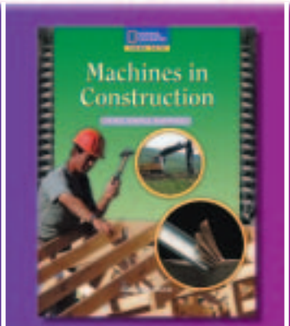
Remind students that how-to books are organized with the title, subheads, labels, important information, and steps for completing a task.



Begin Reading: Pages 23–26

Small Groups





First Activity Block

With the Teacher

Begin Reading

- Review the genre.
- Model using the genre article.
- Read parts of the genre article.

Pairs

Fluency Practice

Students reading *Machines in Sports* pair up with students reading *Machines in Health*. Students reread aloud parts of Article 1 from their own books to practice reading fluency. To each pair, distribute the *Fluency Practice* Master on page 70 of this Teacher's Guide.

Individuals

Independent Reading

Students read *Power Drill User Manual*, Student Book pages 23–26.

To each student, distribute the *Content Reading Guide* Master, page 71 in this Teacher's Guide. Students should use the Master to take notes as they read for specific information.

Pairs

Fluency Practice

Students reading *Machines in Health* pair up with students reading *Machines in Sports*. Students reread aloud parts of Article 1 from their own books to practice reading fluency. To each pair, distribute the *Fluency Practice* Master on page 70 of this Teacher's Guide.

Second Activity Block

Pairs

Fluency Practice

Students reading *Machines in the Home* pair up with students reading *Machines in Construction*. Students reread aloud parts of Article 1 from their own books to practice reading fluency. To each pair, distribute the *Fluency Practice* Master on page 70 of this Teacher's Guide.

With the Teacher

Begin Reading

- Review the genre.
- Model using the genre article.
- Read parts of the genre article.

Pairs

Fluency Practice

Students reading *Machines in Construction* pair up with students reading *Machines in the Home*. Students reread aloud parts of Article 1 from their own books to practice reading fluency. To each pair, distribute the *Fluency Practice* Master on page 70 of this Teacher's Guide.

Individuals

Independent Reading

Students read *Wheelchair User Manual*, Student Book pages 23–26.

To each student, distribute the *Content Reading Guide* Master, page 71 in this Teacher's Guide. Students should use the Master to take notes as they read for specific information.

With the Teacher Small Groups ELL

Lesson Notes for *Machines in the Home*

Model reading a how-to book

Ask students when they would use how-to books. Discuss the parts of a how-to book. Model reading the information on pages 23–24. Distribute the *Content Reading Guide* Master, which students can use to guide them through reading the user manual. Say:

We've just learned about how people use machines to help them do work. Now I'm going to read about how to use a hand mixer.

Begin reading the user manual. Use the labels to describe the parts. Also point out the important features. For example:

The first illustration of the hand mixer has numbered circles on it. These numbers match the numbers listed on the left. By matching the numbers, I can see the name of each part.

Continue making observations about the user manual that will help students draw conclusions about the important features of a how-to book.

Read parts of the user manual

Have students flip through the user manual. Have them notice the illustrations, subheads, and bulleted lists. Say:

We are going to take turns reading information in this user manual.

Before each student reads, reread the title and introduction. Skim the text to point out any words that may be unfamiliar to the reader. Pronounce these words and discuss their meanings. Then have students read chorally or take turns reading the user manual. After students have finished reading, say:

We've just read a user manual about how to use a hand mixer. Now let's reread to find the important features of a user manual. This will help us make sure that we've understood what we have read.

Have students read the user manual again and point out the important features of a user manual.

With the Teacher Small Groups ELL

Lesson Notes for *Machines in Sports*

Model reading a how-to book

Ask students when they would use how-to books. Discuss the parts of a how-to book. Model reading the information on pages 23–24. Distribute the *Content Reading Guide* Master, which students can use to guide them through reading the user manual. Say:

We've just learned about how people use machines to help them do work. Now I'm going to read about how to use a bicycle.

Begin reading the user manual. Use the labels to describe the parts. Also point out the important features. For example:

The first illustration of the bicycle has numbered circles on it. These numbers match the numbers listed on the left. By matching the numbers, I can see the name of each part.

Continue making observations about the user manual that will help students draw conclusions about the important features of a how-to book.

Read parts of the user manual

Have students flip through the user manual. Have them notice the illustrations, subheads, and bulleted lists. Say:

We are going to take turns reading information in this user manual.

Before each student reads, reread the title and introduction. Skim the text to point out any words that may be unfamiliar to the reader. Pronounce these words and discuss their meanings. Then have students read chorally or take turns reading the user manual. After students have finished reading, say:

We've just read a user manual about how to use a bicycle. Now let's reread to find the important features of a user manual. This will help us make sure that we've understood what we have read.

Have students read the user manual again and point out the important features of a user manual.

Lesson 4

Check Understanding

Whole Class

Discuss the Genre

Talk with students about how different types of writing, or genres, have different purposes. Ask:

What is the main reason you would use a how-to book? (to get directions for how to make or do something)

Then review the parts of a how-to book. Ask questions such as:

What are the parts of a how-to book?
What does the title tell you?
Why are the illustrations important?

Ask volunteers to share one thing they learned from the user manual they read. What was most interesting?

Share Learning

Have small groups of students share their books. Organize students into groups of four, with each student reading a different book.

Have each student walk through the user manuals with group members, pointing out the illustrations, subheads, labels, and interesting content.

Then each student should explain in his or her own words something that was interesting from the user manuals.

Read for Specific Information

Bring the class together to create a class chart, using information from the user manuals and students' *Content Reading Guides*. Students can suggest information found in their own books or from a classmate's book. Use at least one example from each user manual.

After completing the chart, ask questions about the genre, such as:

When reading the user manuals, was it easy to find important information?

How are these user manuals similar? How are they different?

Content Reading Guide

Topic	Important features	Things to consider
Hand mixer	Parts of the hand mixer, uses, safety precautions	Do not get the machine or cord wet.
Bicycle	Parts of the bicycle, what to do before riding	Make sure brakes are working.
Power drill	Parts of the power drill, safety precautions, how to set up the drill	Wear safety goggles.
Wheelchair	Parts of the wheelchair, safety precautions, how to set up the wheelchair	Do not go too fast in the wheelchair.

Partially completed class chart

Lesson 5

Whole Class
•Introduce Key Concept Activities

Small Groups
•Finish Reading: Pages 23–26

Whole Class
•Check Understanding

Introduce Key Concept Activities

Whole Class ELL

Have students turn to page 27 in their books. Read the title of the page and point out that there is one activity for each Key Concept statement.

Summarize each activity, and make sure students understand what the product of each activity should be (a concept web, two labeled drawings). Use the art next to each activity to aid in the discussion. Remind students that they can use information from the informational and genre articles to complete each activity.

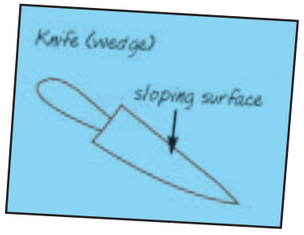
Assigning the Activities

During Lesson 5, students can work in pairs or small groups as they begin working on the Key Concept Activities. Students can complete as much as they can during this Lesson, but they should be able to complete at least one activity.

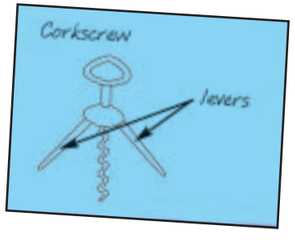
Activity summaries

Key Concept Activity 1
This activity asks students to create a concept web showing different types of work.

Key Concept Activity 2
This activity asks students to draw and label two simple machines.

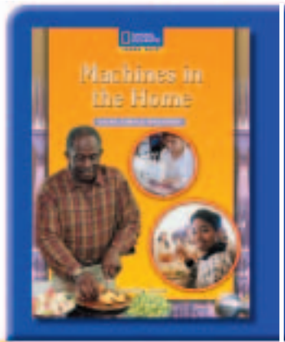


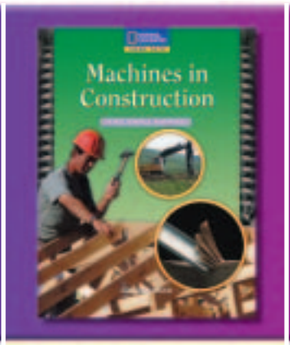
Key Concept Activity 3
This activity asks students to draw and label the simple machines found in two compound machines.



Finish Reading: Pages 23–26

Small Groups





First Activity Block

Pairs/Groups

Key Concept Activities

Students can work in pairs or small groups to complete Key Concept Activity 1. They can also begin Key Concept Activity 2 at this time.

Students should use the Student Book to complete these activities.

Pairs/Groups

Key Concept Activities

Students can work in pairs or small groups to complete Key Concept Activity 1. They can also begin Key Concept Activity 2 at this time.

Students should use the Student Book to complete these activities.

With the Teacher

Discuss and Reread

- Review the genre.
- Review using the genre article.
- Reread parts of the genre article.

Pairs/Groups

Key Concept Activities

Students can work in pairs or small groups to complete Key Concept Activities 2 and 3 at this time.

Students should use the Student Book to complete these activities.

Second Activity Block

Pairs/Groups

Continue Key Concept Activities

Students can continue working on Key Concept Activities 2 and 3. Time permitting, the teacher can meet with students reading *Machines in the Home* to assess students' progress on the Key Concept activities.

Pairs/Groups

Continue Key Concept Activities

Students can continue working on Key Concept Activities 2 and 3. Time permitting, the teacher can meet with students reading *Machines in Sports* to assess students' progress on the Key Concept activities.

Pairs/Groups

Key Concept Activities

Students can work in pairs or small groups to complete Key Concept Activity 1. They can also begin Key Concept Activities 2 and 3 at this time.

Students should use the Student Book to complete these activities.

With the Teacher

Discuss and Reread

- Review the genre.
- Review using the genre article.
- Reread parts of the genre article.

With the Teacher Small Groups ELL

Lesson Notes for *Machines in Construction*

Review reading a how-to book

Have students bring their *Content Reading Guide* Masters to the discussion. Have them turn to page 23 to discuss the parts of a how-to book. Say:

I'm going to read about how to use a power drill. Here is the title of the how-to book: Power Drill User Manual.

Read the introduction and list of parts, pointing out the number labels on the illustration. Continue reading and pointing out other important features of the user manual. Say:

I see that the user manual gives a list of safety precautions. It is very important to read through these before using the power drill.

Continue making observations about the user manual that will help students draw conclusions about the important features of a how-to book.

Reread parts of the user manual

Have students flip through the how-to books. Have them notice the illustrations and bulleted lists. Say:

We are going to take turns rereading the user manual for the power drill. The first time we read, we will learn more about the topic.

Have students take turns reading the user manual. As needed, stop and explain any words or concepts students may need help understanding. After students have finished reading, say:

We've just read a power drill user manual. Now let's use your Content Reading Guide *to discuss the important features you found and things to consider.*

Have students read the user manual and point out the important features of a user manual.

With the Teacher Small Groups ELL

Lesson Notes for *Machines in Health*

Review reading a how-to book

Have students bring their *Content Reading Guide* Masters to the discussion. Have them turn to page 23 to discuss the parts of a how-to book. Say:

I'm going to read about how to use a wheelchair. Here is the title of the how-to book: Wheelchair User Manual.

Read the introduction and list of parts, pointing out the number labels on the illustration. Continue reading and pointing out other important features of the user manual. Say:

I see that the user manual gives a list of safety precautions. It is very important to read through these before using the wheelchair.

Continue making observations about the user manual that will help students draw conclusions about the important features of a how-to book.

Reread parts of the user manual

Have students flip through the how-to books. Have them notice the illustrations and bulleted lists. Say:

We are going to take turns rereading the user manual for the wheelchair. The first time we read, we will learn more about the topic.

Have students take turns reading the user manual. As needed, stop and explain any words or concepts students may need help understanding. After students have finished reading, say:

We've just read a wheelchair user manual. Now let's use your Content Reading Guide *to discuss the important features you found and things to consider.*

Have students read the user manual and point out the important features of a user manual.

Check Understanding

Whole Class

Share Learning

By now, all students have read the first article and the genre article in the Student Book. They have worked together in mixed groups, in pairs, and as a class to discuss the Key Concepts. They have worked independently on the Key Concept activities found on page 27 of the Student Book.

Now students can come together in mixed groups to share the Key Concept activities they have completed. Organize students into groups of four, with each student reading a different book. Explain that each student should share his or her work on the Key Concept activities and compare how other members of the group completed the same assignment. Students should be able to explain another group member's activity, compared to his or her own.

Students can use questions like these to guide their discussion:

How is this group member's information similar to the information I found?

How is this information different?

How does this information relate to the Key Concepts?

After groups of students have finished discussing their projects, bring the class together. Students can share what they've learned by comparing a group member's project with their own.

Use the questions shown above as a guide for the class discussion.

Assessment Check

Key Concept Activity 1

Concept webs should

- ✔ have a label in the center.
- ✔ show four different types of work.
- ✔ show what force does to the object.
- ✔ be neatly completed.

Key Concept Activity 2

Drawings should

- ✔ include two simple machines.
- ✔ have a title for each machine.
- ✔ include labels on the parts of each simple machine.
- ✔ be neatly completed.

Key Concept Activity 3

Drawings should

- ✔ include two compound machines.
- ✔ have a title for each compound machine.
- ✔ include labels on the simple machines that make up each compound machine.
- ✔ be neatly completed.

RESEARCH AND WRITE

Introduce Research and Write

Explain that students will write their own user manuals.

Have students turn to the Research and Write activity beginning on page 28 in their books. Explain that students will be working on steps 1–3 today and steps 4 and 5 in the next writing lesson. Then say:

I am going to read the introduction from the Machines in the Home *book. This introduction is specific to this book, but the introductions in your books will talk about the information you have. Follow along silently as I read to the class.*

Read the introduction and allow time for students to ask questions.

1. Study the Model

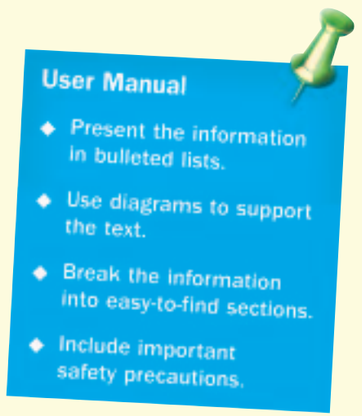
ELL

Read step 1 to the class. Then have students turn to page 23. Say:

On this page, you will find the beginning of a user manual. We are going to use the user manuals on pages 23–26 as a model for writing our own user manuals.

Look at the title. Notice how the title is in large letters and easy to read. Titles should stand out from the rest of the information. The user manuals you write should have a title that is easy to read.

Continue in this way with each of the important parts of the user manuals. Then read the text in the blue box on page 28. This box lists the important parts of writing a user manual.


User Manual
Present the information in bulleted lists.
Use diagrams to support the text.
Break the information into easy-to-find sections.
Include important safety precautions.

2. Choose a Machine

Read step 2 to the class. Remind students that they should choose just one machine that is used in the area that is the focus of their books: in the home, in sports, in construction, or in health. They should draw a design for their machines, take notes, and think of safety precautions for using the machine. They can look in the library or on the Internet to get ideas for their user manuals.

Distribute the *Prewriting* Master to students. Explain that they will use this Master to organize their research and take notes. Read the introduction on the Master and discuss each part.

Students can work in pairs or independently to review the model and conduct research. Students can ask a classmate to help answer questions they may have. As students conduct research, circulate around the classroom to check that students are using the *Prewriting* Master correctly.

Check Progress

Bring the class together to discuss students' progress. Ask questions such as:

Has everyone chosen a topic and completed his or her research?

Are you finding enough information about your topic?

Remind students that they will have time to write, revise, and edit. They will then present their machines to the class.

RESEARCH AND WRITE

Discuss the Writing

Whole Class

Briefly discuss students' progress. Review pages 28–29 in the Student Book.

3. Write a User Manual

Read step 3 to the class while students follow along silently. Remind students to use the user manual in their books as a guide for writing their own user manuals. Remind students that when writing their user manuals, they should focus on getting their ideas on paper. They can fix spelling and grammar mistakes as they review and edit. Circulate around the room and meet with students to help them work through questions they may have about their writing.

4. Read over Your Work

Read step 4 to the class. Give students time to read through their user manuals to make sure that it is easy to follow, lists safety precautions, tells how to care for the machine, and includes diagrams. Remind students that they can also use a peer editor during this step. Peer editors should focus on spelling, grammar, punctuation, sense, and interest level.

Assessment Check

A well-written user manual

- ✔ Subheads similar to the model are used to organize the text.
- ✔ Important information is presented in bulleted lists.
- ✔ Instructions are easy to follow.
- ✔ Safety precautions are included and stated clearly.
- ✔ At least one clearly labeled diagram is used to clarify the text.
- ✔ Writing is free of mechanical errors.

An average user manual

- ✔ Some subheads similar to the model are used to organize the text.
- ✔ Important information is presented in bulleted lists.
- ✔ Instructions are somewhat easy to follow.
- ✔ Safety precautions are included and somewhat clear.
- ✔ At least one labeled diagram is used to clarify the text.
- ✔ Writing has some mechanical errors.

A poorly-written user manual

- ✔ Subheads similar to the model are not used to organize the text.
- ✔ Important information is not presented in bulleted lists.
- ✔ Instructions are not easy to follow.
- ✔ Safety precautions are not included or are not clear.
- ✔ Labeled diagrams do not apply to the text or are not included.
- ✔ Writing has many mechanical errors.

SHARING YOUR WORK

Present Your Machine

Small Groups

As a class, have students turn to page 30 in their books. Read page 30 aloud to the class as students follow along silently. Explain that students will work independently to prepare and give a presentation.

Review the following steps with the class so that students understand each step in the process. Each student should participate in all the steps.

Individual Work

Step 1. Copy your labeled diagram onto an overhead transparency. Make sure your diagram is clearly drawn so the parts of your diagram are easy to see.

Step 2. Explain your machine to the class. Using your transparency on an overhead projector, show the class your machine and point out the different parts. Explain what the machine is used for and how it works.

Step 3. Explain the safety precautions. Explain any possible dangers there are when using your machine. Tell the class how to use the machine in the safest way possible.

Step 4. Show the class how to care for the machine. Explain how to clean, store, and care for parts of your machine.

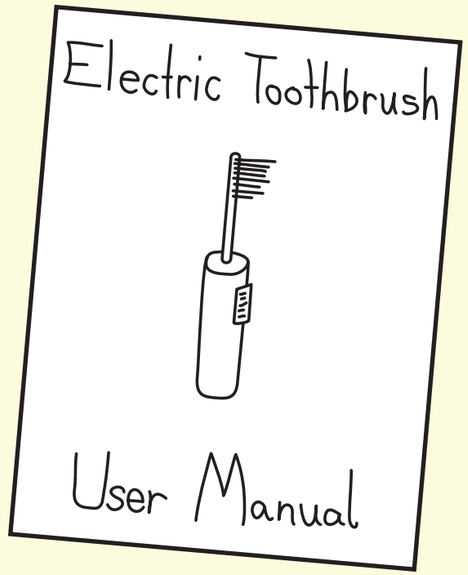
Class Discussion

After each student has completed all four steps, have students discuss the process of writing a user manual and presenting a machine.

Students can work independently or in pairs to answer the following questions in their notebooks:

What did you like most about writing a user manual?

Did you learn something new from someone else's presentation?



Contents

Masters	Purpose
Prereading: 3-Column Chart	Provides a tool for recording students' prior knowledge about the topic before they read
Machines in the Home Vocabulary **Machines in Sports Vocabulary** **Machines in Construction Vocabulary** **Machines in Health Vocabulary**	Provides a tool for developing strategies for book-level vocabulary
Comprehension Model	Provides a Master that can be made into a transparency to model the comprehension strategy
Comprehension Strategy	Provides a tool to help students practice the comprehension strategy
Word Cards, Machines in the Home **Word Cards, Machines in Sports**	Provides cards that can be cut out and used to develop vocabulary
Share Learning	Provides a tool students can use in small groups to compare content across all Student Books
Key Concept Questions	Provides a tool students can use in small groups to answer the Key Concept questions shown on page 19 in the Student Book
Fluency Practice	Provides a tool for pairs of students as they reread the text to improve fluency
Content Reading Guide	Provides a tool to help students record specific information
Prewriting	Provides a tool for organizing students' ideas before they write
Open-Book Test	Provides an opportunity for students to demonstrate both their understanding of the content and their ability to read for specific information
Machines in the Home Test **Machines in Sports Test** **Machines in Construction Test** **Machines in Health Test**	Provides an opportunity for students to demonstrate their understanding of the content with differentiated multiple-choice and short-answer questions

Name _____ Book title _____

Prereading: 3-Column Chart

You will be reading about simple machines that are used every day. In column 1, write some machines that you use. In column 2, explain how the machine helps you do work. At the end of Lesson 1, add to columns 1 and 2 and fill in column 3, listing whether each machine is simple or compound. Write any questions you have on the back of this sheet.

Machine	How this machine helps us do work	Simple/Compound

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Name _____

Vocabulary: Definition Chart

The words below are from *Machines in the Home*. Find each word in the glossary of your book. Write a short definition in the second column. In the next column, write examples or words that describe the word. In the last column, write words that are not the vocabulary word.

Word	Definition	Examples or Description	Nonexamples
compound machines			
force			
machines			
simple machines			
work			
fulcrum			
load			
wedge			

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Name _____

Vocabulary: Definition Chart

The words below are from *Machines in Sports*. Find each word in the glossary of your book. Write a short definition in the second column. In the next column, write examples or words that describe the word. In the last column, write words that are not the vocabulary word.

Word	Definition	Examples or Description	Nonexamples
compound machines			
force			
machines			
simple machines			
work			
gears			
lever			
load			

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Name _____

Vocabulary: Definition Chart

The words below are from *Machines in Construction*. Find each word in the glossary of your book. Write a short definition in the second column. In the next column, write examples or words that describe the word. In the last column, write words that are not the vocabulary word.

Word	Definition	Examples or Description	Nonexamples
compound machines			
force			
machines			
simple machines			
work			
pulley			
thread			
wedge			

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Name _____

Vocabulary: Definition Chart

The words below are from *Machines in Health*. Find each word in the glossary of your book. Write a short definition in the second column. In the next column, write examples or words that describe the word. In the last column, write words that are not the vocabulary word.

Word	Definition	Examples or Description	Nonexamples
compound machines			
force			
machines			
simple machines			
work			
fulcrum			
pitch			
wedge			

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Name _____ Book title _____

Comprehension Model: Asking Questions

A World of Machines

When you hear the word **machine**, what's the first thing that comes to mind? A giant bulldozer or a crane? A bicycle? Today our world is filled with many types of machines that help us get **work** done.

Our lives would be very different without machines. They're everywhere! From the washer that cleans your clothes to the bus that takes you to school, we depend on machines for many things. A machine helps to make something move and can make doing work easier. Scientists say that work has been done when a force is used to move an object over a distance.

Machines that are called **simple machines** do not have many moving parts. Knives and forks, doorknobs, and skate wheels are all simple machines. **Compound machines** are made of two or more simple machines put together. Cars, bicycles, trains, and even your body are all compound machines!

A bicycle is a compound machine that helps us get from place to place.

Steps for Asking Questions

- Ask questions about *how* you read.
- Ask questions about *what* you read.
- Ask questions to learn more.
- Remember that some of your questions might not be answered.

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Name _____ Book title _____

Comprehension Strategy: Asking Questions

Use this chart as you read. Write questions you have in column 1. Write answers you find in column 2. In column 3, you can write any comments you have about what you read.

My Questions	Answers	Comments

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Name _____

Word Cards: Machines in the Home

Cut along the dotted lines. Then fold each strip along the solid line so the word will be on one side and the definition will be on the other. Practice using these flash cards with a partner to help you remember definitions for each word.

compound machines	machines that are made up of more than one simple machine
force	something that moves, changes, or stops an object
lever	a straight bar or rod that rotates about a fixed place
machines	tools or other devices that help people do work
pulley	a grooved wheel and rope system, used to move loads
simple machines	devices that change how forces act
wheel and axle	a wheel joined to a pole or rod
work	the result of force moving, stopping, or changing an object

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Name _____

Word Cards: Machines in Sports

Cut along the dotted lines. Then fold each strip along the solid line so the word will be on one side and the definition will be on the other. Practice using these flash cards with a partner to help you remember definitions for each word.

compound machines	machines that are made up of more than one simple machine
force	something that moves, changes, or stops an object
fulcrum	the fixed point on which a lever turns or swivels
machines	tools or other devices that help people do work
screw	a pole with a ridge called a thread that spirals around it
simple machines	devices that change how forces act
wedge	an object with one or more sloping sides that may end in a sharp edge or point
work	the result of force moving, stopping, or changing an object

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Name _____ Book title _____

Share Learning

Work with students who have read books different from yours. Each group member is the expert on one area where machines are used. Each member should share information from his or her book to complete a row on the chart.

Area where machines are used	Ways force is used in this area	The six simple machines/Examples	Examples of compound machines

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Name _____ Book title _____

Key Concept Questions

Read the questions on page 19 of your book. Think about what you have learned from reading your book. Then answer the questions below.

1. What are three things that force can do to an object? Give an example of each.

2. In science, what is the connection between force and work?

3. Name the six simple machines. Explain how each one can help people work.

4. Give two examples of compound machines. Explain how they help people work.

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Name _____ Book title _____

Fluency Practice

You will be reading parts of your book with a partner. You will take turns being the reader and the listener.

Readers will read from their own books. You will pick a short section to read, and you will read this same section three times.

Listeners will correct missed words. When you hear a missed word, say, STOP, and the word. Have the reader repeat this word. Then, ask the reader to read that sentence again. Tell the reader how to improve after each reading, and then fill out the checklist for the reader.

Reading Checklist

Reader Name: _____

Reading #1: great good so-so not very good

Reading #2: great good so-so not very good

Reading #3: great good so-so not very good

Check how the reader improved

_____ My partner read more smoothly.

_____ My partner knew more words.

_____ My partner stopped for more punctuation.

_____ My partner read with more expression.

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Name _____ Book title _____

Content Reading Guide: How-to books

You can read how-to books to find out how to do or make something. As you read pages 23–26 in your book, look for the important features of a user manual. Also look for any special things to consider when using a machine.

Topic: _____

Important Features	Things to consider

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Name _____ Book title _____

Prewriting

You will be writing a user manual. Your manual should include information about how to use a machine that you would find in the area your book is about. Use the user manual beginning on page 23 as a model.

Machine: _____

Subheads to use to organize my information: _____

_____

_____

_____

How to use this machine: _____

_____

_____

_____

Safety precautions: _____

_____

_____

_____

_____

How to care for this machine: _____

_____

_____

_____

_____

Other important information to include: _____

_____

_____

_____

_____

_____

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Name _____ Book title _____

Open-Book Test

1. _____ is something that moves, changes, or stops an object.
2. _____ are devices that change how forces act.
3. Tools that are used to help people do work are called _____ .
4. _____ is the result of force moving, stopping, or changing an object.
5. _____ are machines that are made up of more than one simple machine.
6. What are the six simple machines?

   _____

   _____

   _____

7. How do machines help people do work?

   _____

   _____

8. What are some compound machines?

   _____

   _____

   _____

9. Look at the diagram on page 23 of your book. What is the part of this machine labeled with a number 4?

   _____

10. What is being shown in Figure B on page 24?

    _____

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Name _____

Test

Circle the letter of the correct answer.

1. Work always requires

A. machines.

B. electricity.

C. an inclined plane.

D. force.

2. All of the following are simple machines EXCEPT a

A. wheel and axle.

B. screw.

C. fulcrum.

D. pulley.

3. Simple machines

A. change how forces act.

B. are not used in modern times.

C. are modern inventions.

D. run on electricity.

4. Which of the following describes a wedge?

A. a straight bar or rod that rotates about a fixed place

B. an object with one or more sloping sides that may end in a sharp edge or point

C. a grooved wheel and rope system, used to move loads

D. a wheel joined to a pole or rod

5. All how-to books

A. give directions.

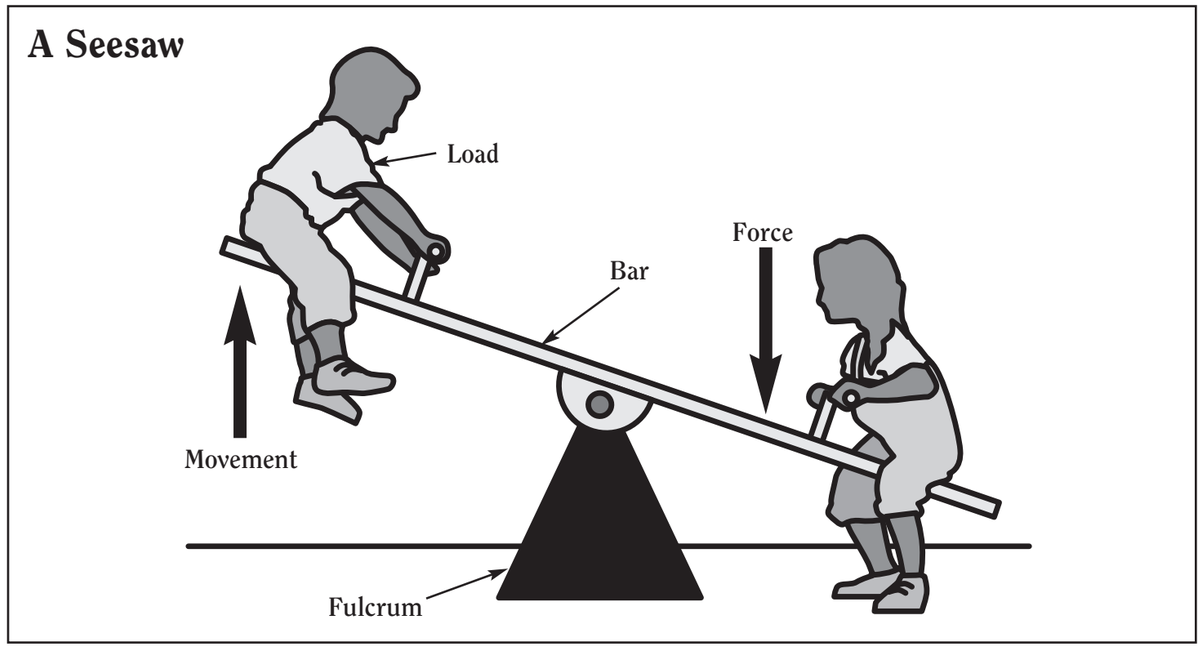
B. label parts of a machine.

C. are manuals.

D. all of the above.

6. Name a compound machine used in the home. Explain what makes it a compound machine.

Use the labeled illustration to answer questions 7–8.



7. Write one sentence that tells what this labeled illustration is about.

8. What kind of simple machine is this seesaw? How do movement and force relate to each other in this simple machine?

Name _____

Test

Circle the letter of the correct answer.

1. Work always requires

A. machines.

B. fuel.

C. an axle.

D. force.

2. All of the following are simple machines EXCEPT a

A. wheel and axle.

B. screw.

C. fulcrum.

D. pulley.

3. Simple machines

A. change how forces act.

B. are not used in modern times.

C. are modern inventions.

D. run on electricity.

4. Which of the following describes a wedge?

A. a straight bar or rod that rotates about a fixed place

B. an object with one or more sloping sides that may end in a sharp edge or point

C. a grooved wheel and rope system, used to move loads

D. a wheel joined to a pole or rod

5. All how-to books

A. give directions.

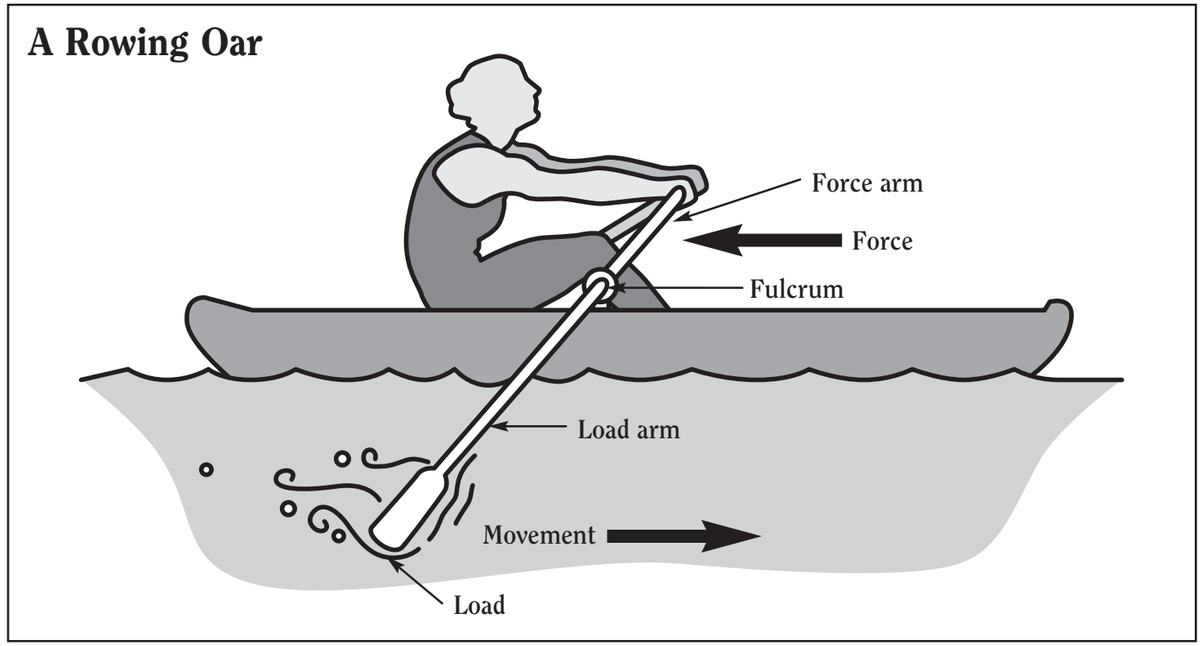
B. label parts of a machine.

C. are manuals.

D. all of the above.

6. Name a compound machine used in sports. Explain what makes it a compound machine.

Use the labeled illustration to answer questions 7–8.



7. Write one sentence that tells what this labeled illustration is about.

8. What kind of a simple machine is a rowing oar? How do movement and force relate to each other in this simple machine?

Name _____

Test

Circle the letter of the correct answer.

1. Work always requires

A. machines.

B. fuel.

C. mechanical advantage.

D. force.

2. All of the following are simple machines EXCEPT a

A. wheel and axle.

B. screw.

C. fulcrum.

D. pulley.

3. Simple machines

A. change how forces act.

B. are not used in modern times.

C. are modern inventions.

D. require fuel or electricity.

4. Which of the following describes a wedge?

A. a straight bar or rod that rotates about a fixed place

B. an object with one or more sloping sides that may end in a sharp edge or point

C. a grooved wheel and rope system, used to move loads

D. a wheel joined to a pole or rod

5. All how-to books

A. give directions.

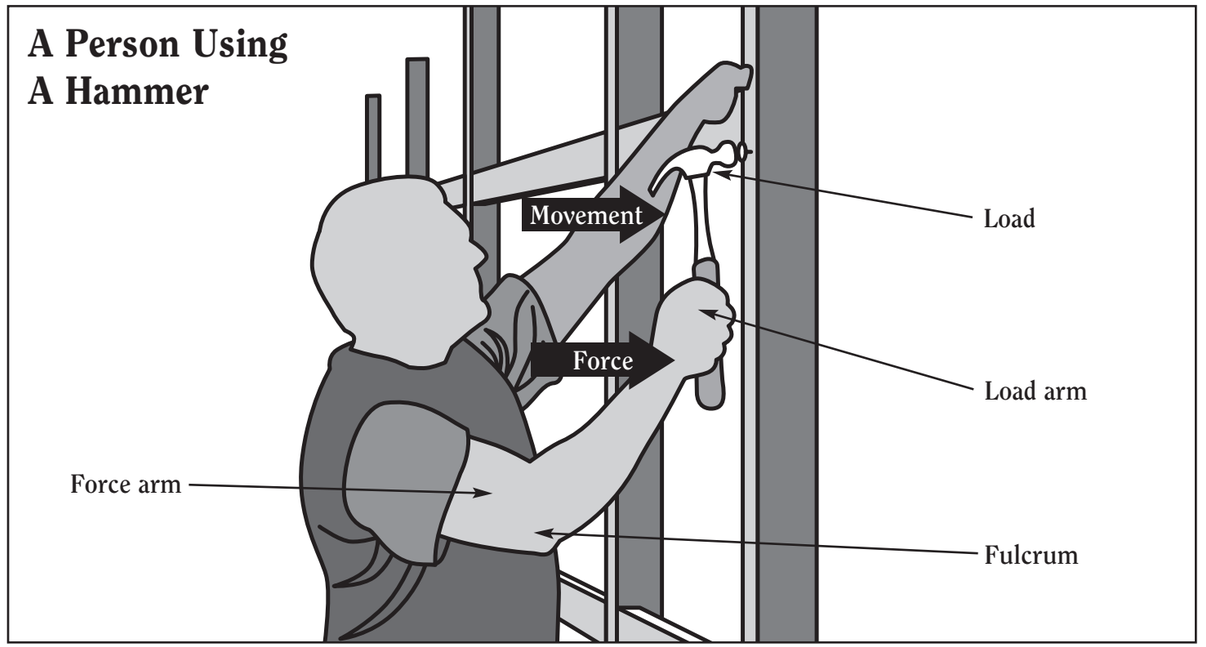
B. label parts of a machine.

C. are manuals.

D. all of the above.

6. Name a compound machine used in construction. Explain what makes it a compound machine.

Use the labeled illustration to answer questions 7–8.



7. Write one sentence that tells what this labeled illustration is about.

8. What kind of simple machine is created by the arm and the hammer? Where does the force come from in this illustration and what does the force make happen?

Name _____

Test

Circle the letter of the correct answer.

1. Work always requires

A. machines.

B. mechanical advantage.

C. moving an object.

D. force.

2. All of the following are simple machines EXCEPT a

A. wheel and axle.

B. screw.

C. fulcrum.

D. pulley.

3. Simple machines

A. change how forces act.

B. do not give a mechanical advantage.

C. are modern inventions.

D. are not used in modern health care.

4. Which of the following describes a wedge?

A. a straight bar or rod that rotates about a fixed place

B. an object with one or more sloping sides that may end in a sharp edge or point

C. a grooved wheel and rope system, used to move loads

D. a wheel joined to a pole or rod

5. All how-to books

A. give directions.

B. label parts of a machine.

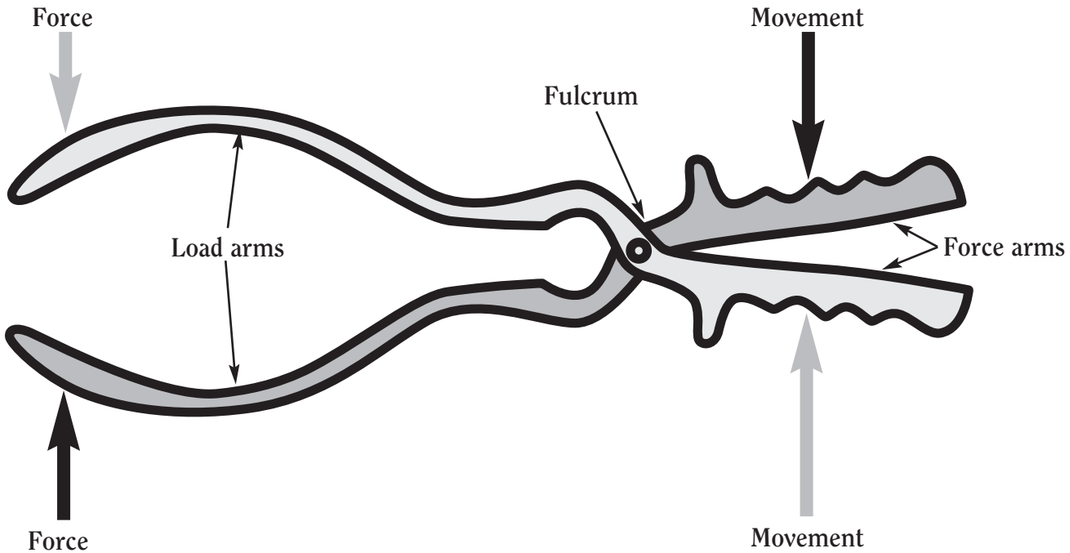
C. are manuals.

D. all of the above.

6. Name a compound machine used in health care. Explain what makes it a compound machine.

Use the labeled illustration to answer questions 7–8.

Forceps



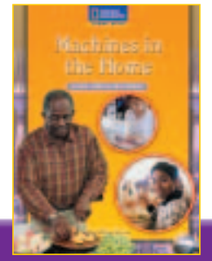
7. Write one sentence that tells what this labeled illustration is about.

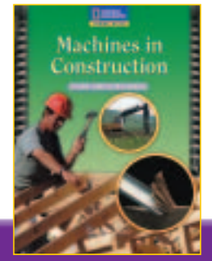
8. What simple machine is used in forceps? Explain the relationship between movement and force in this simple machine.

Test Answers

OPEN-BOOK TEST

Distribute the *Open-Book Test* Master to students. This allows students to demonstrate both their understanding of the content and their ability to read for specific information. Students should work quietly and independently to complete this test during this 20-minute period.





Test Questions

1. [Force] **is something that moves, changes, or stops an object.**
2. [Simple machines] **are devices that change how forces act.**
3. **Tools that are used to help people do work are called** [machines]**.**
4. [Work] **is the result of force moving, stopping, or changing an object.**
5. [Compound machines] **are machines that are made up of more than one simple machine.**

6. What are the six simple machines?	wedge, lever, inclined plane, screw, wheel and axle, pulley	wedge, lever, inclined plane, screw, wheel and axle, pulley	wedge, lever, inclined plane, screw, wheel and axle, pulley	wedge, lever, inclined plane, screw, wheel and axle, pulley
7. How do machines help people do work?	Machines make doing work easier.	Machines make doing work easier.	Machines make doing work easier.	Machines make doing work easier.
8. What are some compound machines?	corkscrew, faucet, sewing machine	bicycle, sailboat, pitching machine	shovel, cement mixer, crane	surgical scissors, prosthetic arm, wheelchair
9. Look at the diagram on page 23 of your book. What is the part of this machine labeled with a number 4?	beater holes	front brake	forward or reverse switch	armrest frames
10. What is being shown in Figure B on page 24?	The mixer should not be put in water.	A person riding a bicycle with the seat at the correct height	A person wearing safety glasses	A person folding a wheelchair

Answers to Multiple-Choice Questions

1. **D**
2. **C**
3. **A**
4. **B**
5. **A**

Scoring Guides

Struggling readers may provide responses that are less complete than those provided by more advanced readers. You can take this into account when grading students' responses.

Question 6

Complete The response names a compound machine used in the home, such as a corkscrew, faucet, sewing machine, or can opener. The response identifies that it is a compound machine because it uses two or more simple machines—wedge, lever, inclined plane, screw, wheel and axle, or pulley (e.g., a corkscrew uses a wheel and axle and levers).

Partial The response names a compound machine used in the home and recognizes that it is a compound machine because it uses two or more simple machines, but does not specify which simple machines it uses.

Unsatisfactory/Incorrect The response includes little or no information related to a compound machine used in the home.

Question 7

Complete The response is a complete sentence that tells what the diagram is mostly about. The response includes information related to the parts of a seesaw and how it works.

Partial The response is a complete or incomplete sentence that tells what the diagram is partly about. The response includes some information related to a seesaw.

Unsatisfactory/Incorrect The response is an incomplete sentence that does not relate to the diagram. The response does not refer to a seesaw.

Question 8

Complete The response identifies the seesaw as a lever and recognizes that the force and the movement go in opposite directions.

Partial The response identifies the seesaw as a lever or recognizes that the force and the movement go in opposite directions.

Unsatisfactory/Incorrect The response does not identify the seesaw as a lever nor recognize that the force and the movement go in opposite directions.

Answers to Multiple-Choice Questions

1. **D**
2. **C**
3. **A**
4. **B**
5. **A**

Scoring Guides

Struggling readers may provide responses that are less complete than those provided by more advanced readers. You can take this into account when grading students' responses.

Question 6

Complete The response names a compound machine used in sports, such as a bicycle, sailboat, pitching machine, or fishing road. The response identifies that it is a compound machine because it uses two or more simple machines—wedge, lever, inclined plane, screw, wheel and axle, or pulley (e.g., a sailboat uses a wedge and levers).

Partial The response names a compound machine used in sports and recognizes that it is a compound machine because it uses two or more simple machines, but does not specify which simple machines it uses.

Unsatisfactory/Incorrect The response includes little or no information related to a compound machine used in sports.

Question 7

Complete The response is a complete sentence that tells what the diagram is mostly about. The response includes information related to a rowing oar and how it works.

Partial The response is a complete or incomplete sentence that tells what the diagram is partly about. The response includes some information related to a rowing oar.

Unsatisfactory/Incorrect The response is an incomplete sentence that does not relate to the diagram. The response does not refer to a rowing oar.

Question 8

Complete The response identifies the rowing oar as a lever and recognizes that the force and the movement go in opposite directions.

Partial The response identifies the rowing oar as a lever or recognizes that the force and the movement go in opposite directions.

Unsatisfactory/Incorrect The response does not identify the rowing oar as a lever nor recognize that the force and the movement go in opposite directions.

Answers to Multiple-Choice Questions

1. **D**
2. **C**
3. **A**
4. **B**
5. **A**

Scoring Guides

Struggling readers may provide responses that are less complete than those provided by more advanced readers. You can take this into account when grading students' responses.

Question 6

Complete The response names a compound machine used in construction, such as a shovel, cement mixer, crane, or vice. The response identifies that it is a compound machine because it uses two or more simple machines—wedge, lever, inclined ramp, screw, wheel and axle, or pulley (e.g., a cement mixer uses a wheel and axle and a pulley).

Partial The response names a compound machine used in construction and recognizes that it is a compound machine because it uses two or more simple machines, but does not specify which simple machines it uses.

Unsatisfactory/Incorrect The response includes little or no information related to a compound machine used in construction.

Question 7

Complete The response is a complete sentence that tells what the diagram is mostly about. The response includes information related to a person using a hammer and how it works.

Partial The response is a complete or incomplete sentence that tells what the diagram is partly about. The response includes some information related to a person using a hammer.

Unsatisfactory/Incorrect The response is an incomplete sentence that does not relate to the diagram. The response does not refer to a person using a hammer.

Question 8

Complete The response identifies the arm using the hammer as a lever and recognizes that the force comes from the arm or muscles which make(s) the hammer move.

Partial The response identifies the arm using the hammer as a lever or recognizes that the force comes from the arm or muscles which make(s) the hammer move.

Unsatisfactory/Incorrect The response does not identify the arm using the hammer as a lever and does not recognize where the force comes from nor that it makes the hammer move.

Answers to Multiple-Choice Questions

1. **D**
2. **C**
3. **A**
4. **B**
5. **A**

Scoring Guides

Struggling readers may provide responses that are less complete than those provided by more advanced readers. You can take this into account when grading students' responses.

Question 6

Complete The response names a compound machine used in health care, such as surgical scissors, dental instruments, a prosthetic arm, or a wheelchair. The response identifies that it is a compound machine because it uses two or more simple machines—wedge, lever, inclined plane, screw, wheel and axle, or pulley (e.g., surgical scissors are made up of wedges and levers).

Partial The response names a compound machine used in health care and recognizes that it is a compound machine because it uses two or more simple machines, but does not specify which simple machines it uses.

Unsatisfactory/Incorrect The response includes little or no information related to a compound machine used in health care.

Question 7

Complete The response is a complete sentence that tells what the diagram is mostly about. The response includes information related to forceps and how they work.

Partial The response is a complete or incomplete sentence that tells what the diagram is partly about. The response includes some information related to forceps.

Unsatisfactory/Incorrect The response is an incomplete sentence that does not relate to the diagram. The response does not refer to parts of forceps.

Question 8

Complete The response identifies the forceps as a pair of levers and recognizes that the force and the movement go in opposite directions or that moving the handles or force arms together squeezes the blades or force arms together.

Partial The response identifies the forceps as a pair of levers or recognizes that the force and the movement go in opposite directions or that moving the handles or force arms together squeezes the blades or force arms together.

Unsatisfactory/Incorrect The response does not identify the forceps as a pair of levers nor recognize the relationship between force and movement in this simple machine.

Notes

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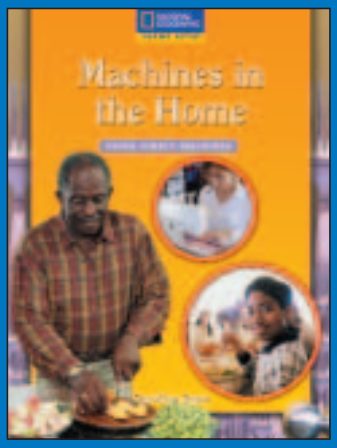

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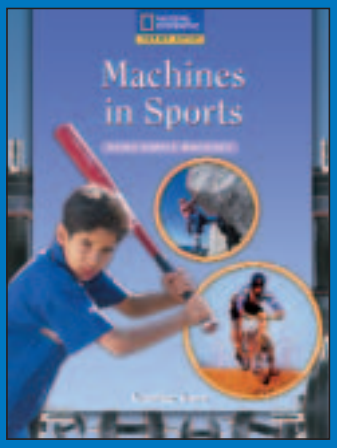

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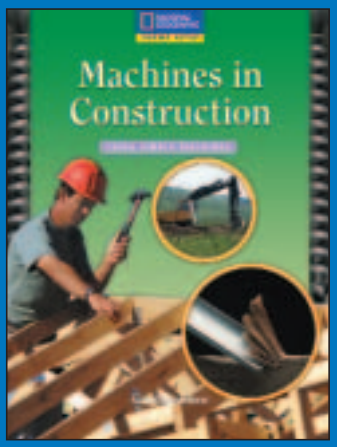

Level C

Level D

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